AMERICAN BEE JOURNAL

DECEMBER, 1921

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CHICO, CALIFORNIA

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ALTITUDE AND SECRETION OF NECTAR

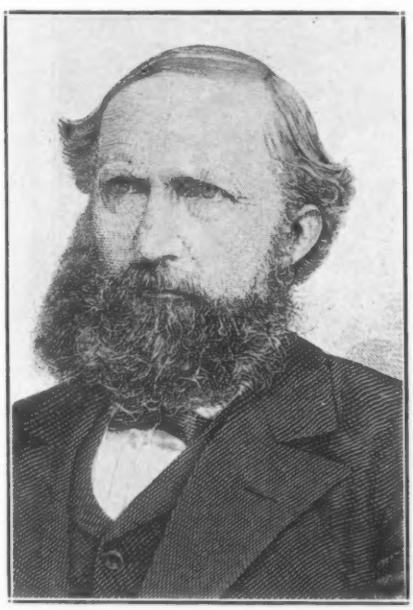
An Account of the Effect of Elevation, Temperature, Etc., on the Amount of Nectar Available to the Bees.—By John H. Lovell.

THE secretion of nectar is at once one of the most interesting and baffling functions of plant life. The older flower biologists, Mueller and Kerner, describe the nectaries and their position at great length, but of the relation to the soil, climate and temperature to secretion they knew little. We suspect that Mueller would have been not a little astonished had he been told of the vagaries of alfalfa and white clover in the production of nectar. Most of our information on this subject is due to the observations of beekeepers, and will be found recorded in the files of the bee journals. A large amount of data has been accumulated as to the facts, but the influence of the various factors is still very imperfectly understood.

Similarity of Conditions in Mountainous and Arctic Regions

The effect of altitude on the secretion of nectar has lately been the subject of frequent discussion, and it is proposed in this paper to briefly review conditions prevailing in Alpine regions. It is a problem of great practical as well as theoretical interest to the beekeeper. As nearly the same conditions prevail at high latitudes as at high elevations, it is desirable to compare the floras of these two regions. In both Alpine and Arctic districts the plants are exposed to low temperature and intense light. At an elevation of a mile or more the air is less dense, or thinner, and intercepts less sunlight than in the plains. As we advance in the summer toward the North Pole the days become longer and the earth receives more of the sun's rays than farther south. In both cases, also, the cold gradually increases until plant life practically disappears. Mountain regions differ chiefly from northern regions in that the pressure of the air is less in the former than in the latter.

The two regions agree again in that both have short summers, and vegetation is obliged to "hurry up" in order to flower and fruit before winter. In



Hermann Mueller, author of "Flowers of the Alps" and of the "Fertilization of Flowers"

Alpine districts the flowering period is very short, not lasting more than two or three months. Spring beauty (**Claytonia**) and dog-tooth violet (**Erythronium**), plants which in the lowlands bloom in April, do not bloom until June in Alpine meadows. But the Alpine season soon catches up with that of the lowlands, and in August is ahead of it, goldenrod and gentians blooming earlier in the mountains than in the lowlands. The same thing occurs in high altitudes, as in Alaska and Scandinavia, and barberry ripens ten days earlier in northern Norway than in southern Sweden.

Alpine and Arctic Flowers

Thus in Alpine regions there is no spring and no autumn, only a short summer, followed by a cold winter. All the flowers must blossom in a short time, and almost simultaneously there appear a great variety of colors, as yellow five-fingers, blue gentians, red pinks and primroses, and saxifrages in every color. There is the same remarkable variety of hues in an Alaskan meadow. After his visit to Alaska glaciers, Burroughs wrote of the meadows:

"Starred with flowers of every hue,
Gold and purple, white and blue,
Painted cup, Anemone,
Jacob's ladder, fleur-de-lis,
Orchid, harebell, shooting star,
Crane's-bill, lupine, seen afar,
Primrose, poppy, saxifrage,
Pictured type on Nature's page."

For six summers Hermann Mueller investigated the flowers of the Alps, and then published the results of his observations in his book "Alpenblumen," or "Flowers of the Alps." Mueller, indeed, died in the Tyrol. On the day of his death he had written a long letter to his son, and he had no premonition of his fate. Suddenly, on the 25th of August, 1883, a pulmonary attack closed his useful life. It was fitting that a life devoted to the study of highland flowers should come to its close among them. According to Mueller, many flowers of the Alps have brighter colors, secrete more nectar and are more strongly scented than the same species growing on the plains. Examples will be given later.

According to Schuebeler, who made many observations, the flowers and fruits of Scandanavia are brighter colored and have a stronger fragrance than those in lower altitudes. Sufficient evidence has been given to show that the conditions in mountainous or Alpine sections, and in northern regions, are very similar, and affect the flowers in both regions in much the same way.

Altitude and Nectar Secretion

At this point, before inquiring into the agencies affecting nectar secretion, let us establish the fact that flowers at high elevations and high latitudes tend to secrete nectar more freely than in opposite situations. Mueller states that in the lowlands the spur of an orchid (**Platanthera solstialis**) was only about a third filled with nectar, but that in the Alps it was over half full. According to Bonnier and Flahault **Silene inflate,** one of the pink family, was much richer in nectar at an elevation of 5,895 feet than at an elevation of 1,300 feet. They also cite the statistics gathered by the French Department of the Pyrenees, from which it would appear that the average honey production per colony was from sea-level to 1,000 feet, 6 lbs. 10 oz., and that with every rise of 1,000 feet it increased from 2 to 4 pounds per colony, until at 4,000 to 5,000 feet it was 19 lbs. 13 oz. ("Alpenblumen, p. 564). It is difficult to decide just how much importance is to be attached to these figures in the absence of full data, but they certainly point to a more abundant nectar secretion with an increase in altitude.

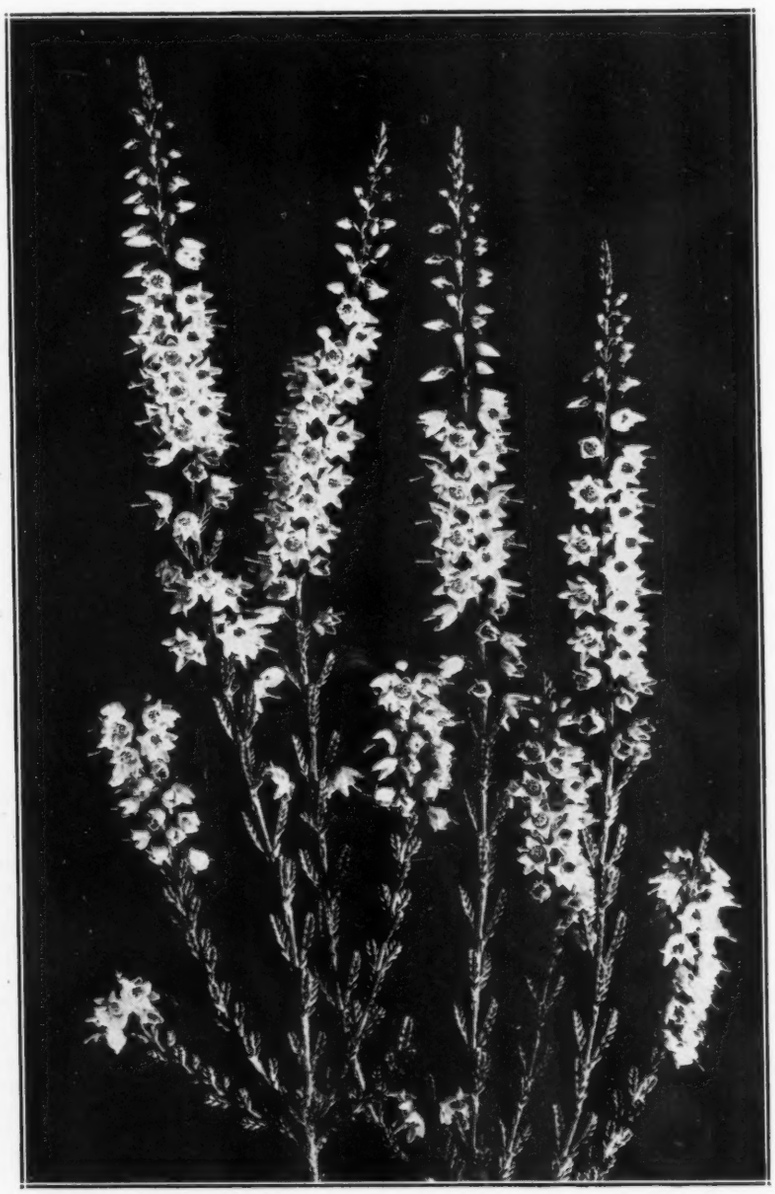
In California, Dr. Phillips was informed by several prominent beekeepers that with an increase of altitude the sages yielded larger crops of honey. According to Mr. Frank C. Pellett, in this State, the sage flow is reported to be much more dependable at higher elevations. Mr. M. C. Richter, the well-known author of the Bulletin on California Honey Plants, writes, "There is a great deal of evidence pointing to a more profuse nec-

Blossoms of alfalfa

tar secretion at higher elevations." A beekeeper at Grand Junction, Colo., in June, 1919, wrote to the author that while three of his apiaries were getting barely enough nectar to keep them alive, three others 1,800 feet higher and 35 miles away, had filled the supers, and he was extracting a good crop. "In the lower valleys alfalfa has not amounted to much for some years, and most of the honey has been secured after August 1."

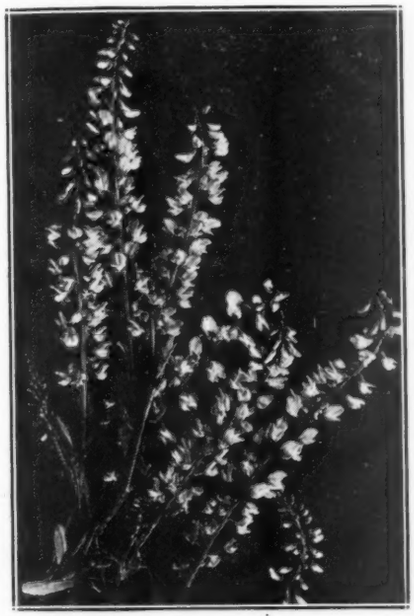
On the effect of altitude on the secretion of nectar by alfalfa, in Kansas, some very interesting observations have been made by Mr. A. V. Small, of Augusta. He writes: "Where the river valley of the Kansas River is above 1,000 feet, alfalfa in Kansas is one of the major honey plants; but, where the valley is below 1,000 feet it is one of the minor honey plants, practically ceasing to yield between 800 and 900 feet." The valley at Topeka has an elevation of about 900 feet and here alfalfa is valueless as a source of nectar. Fifty miles westward, Manhattan, on the same river, has an elevation of 1,000 feet, and bees work on alfalfa freely. The 1,000-foot elevation line runs from Atchison, in the northwest corner, in a very irregular series of curves and loops to Sedan, near the south border line. Small says that he has checked the effect of altitude on nectar secretion back and forth across this line and the conclusion given above holds with remarkable accuracy.

Why does alfalfa in eastern Kansas cease to yield nectar between 800 and 900 feet, but becomes a good honey plant above 1,000 feet? As it would seem that so small a difference in altitude could not so greatly affect nectar secretion, it is of much inter-



Blossoms of the heather. This shrub covers thousands of acres of moorland in Scandinavia and Great Britain. In England, during a two-years record, a hive on scales showed the greatest yield on a day which began with a heavy early morning frost.

est in this connection to record a similar case in eastern Maryland. The following observations by Dr. Phillips on the secretion of nectar by tulip-tree have, I believe, never before been published: "Tulip-tree grows in asso-



Blossoms of white sweet clover

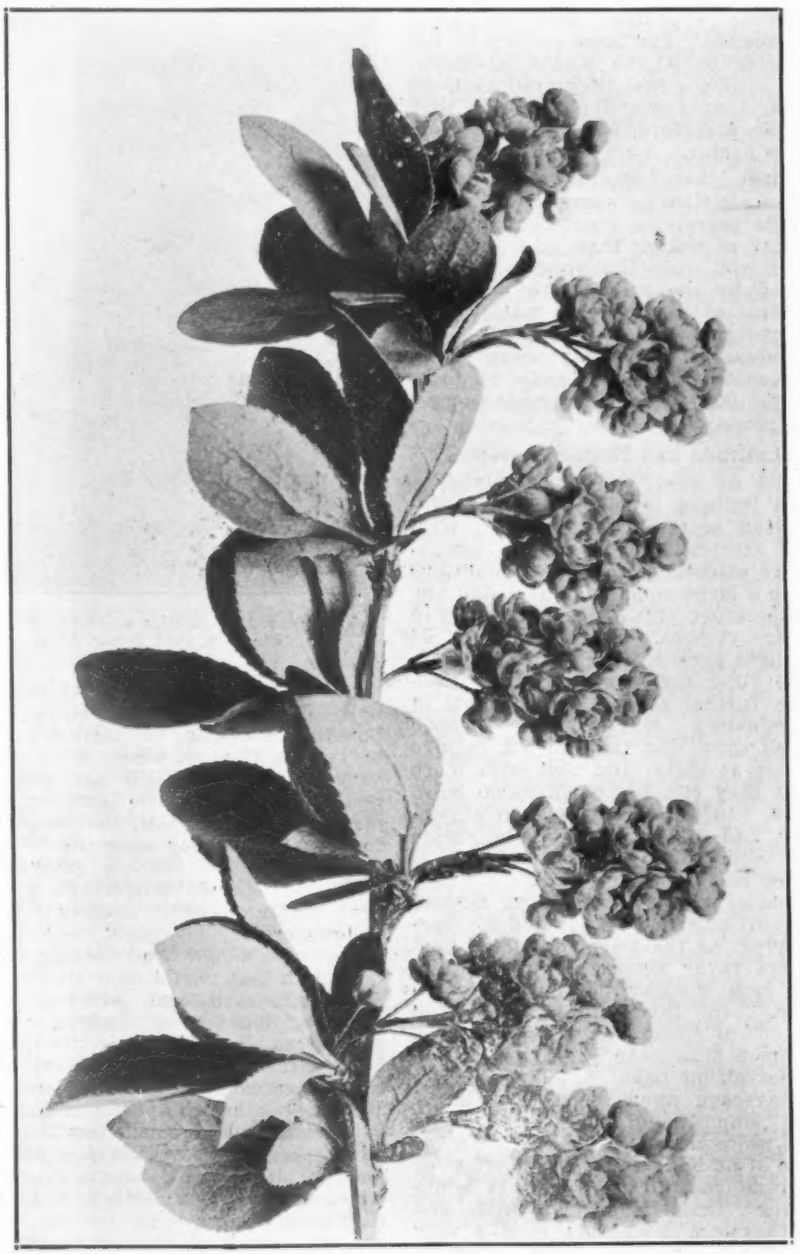
ciation with chestnut, oak, walnut, hickory, maples and beech, and sometimes with scrub pines. Its chief importance as a honey plant is in Tennessee, Kentucky and the Carolinas, and the Ohio Valley. In Virginia and Maryland it is perhaps less abundant, although near Washington, above the fall line, it is sufficiently abundant to give a regular honey crop. We never secured a crop from this species when our apiary was below the fall line, in the city, or at Arlington, Va., or College Park, Md."

The "fall line" is the line separating the Coastal Plain from the Piedmont Plateau, or the line where the tide-water rivers cease to be navigable. In Virginia this ascent ranges from 100 to 200 feet, but in eastern Maryland it is probably less. It is noteworthy that in the higher part of the city of Washington tulip-tree yields well, but not in the lower part.

The obvious explanation of the secretion of nectar by alfalfa and tulip-tree at higher altitudes, in the localities mentioned, would seem to be the decrease in atmospheric pressure. At Alpine heights the evaporation of water vapor by leaves is hastened by the thinness of the air. But it may be urged with much force that a rise of only one or two hundred feet would make little difference in air pressure. As a matter of fact 100 feet would cause a decrease in air pressure of only a little more than eight-tenths of an ounce per square inch. Moreover, under favorable conditions, the secretion of nectar by alfalfa is largely independent of air pressure, since in Imperial Valley, California, 200 feet below sea level, it yields immense crops of honey. In Kansas the good alfalfa pasturage for bees is restricted to the narrow stream valleys, while the uplands, no matter how great their elevation, yield little nectar, owing to the small rainfall. A beekeeper at Oshkosh, Neb., on the Platte River, writes that although sweet clover and alfalfa are abundant at an altitude of nearly 4,000 feet, the air is so dry that little nectar is secreted, and that his experience in beekeeping has been a failure. The small amount of experimental evidence available is not very satisfactory; but, so far as it goes, it points to no relation between atmospheric pressure and nectar secretion. But according to the 29-year record at Clarinda, Iowa, a low barometer apparently favored honey production. Any definite conclusion until more data is obtained, seems, therefore, impossible. It is by no means improbable, assuming all other factors to be favorable, that a slight change in air pressure might start nectar secretion, for example, when the cells of the nectary are overfilled with water and the elastic walls of the cells are under great strain.

Red Coloration and the Sugar Content of Alpine Plants

Very conclusive evidence that plants at Alpine heights produce more sugar than in the lowlands is shown by the great amount of red and purple coloration they contain. Mueller ("Alpenblumen", p. 563) gives a list of flowers which contain more and brighter red and blue pigments than the same species contain in the lowlands. But the red coloration is by no means confined to the flowers; it



Blossoms of the barberry (*Berberis vulgaris*). A Northern shrub which blooms earlier in Arctic regions than further south

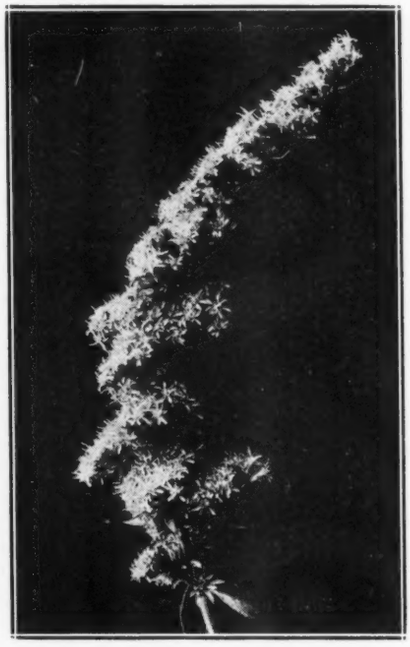
extends to the leaves and stems. Kerner sowed the seed of summer savory, in an experimental garden at a height of 7,100 feet above sea level, in the Tyrol, and the plants developed coloring matter in extraordinary abundance, and not only the leaves but the stems became a dark violet.

Red coloration is due to a liquid known as anthocyanin. When this liquid is acid it is red, but when alkaline, blue. A red rose may be changed to a blue one by dipping it in a weak alkali, and again turned back to red by dipping it in a weak acid. Overton has shown by many experiments that the production of red coloring depends on three factors: intense light, low temperature, and a cell-sap rich in sugar. Cut stems of lilies and other land plants would not develop red coloration, when placed in solution, until 2 per cent of an invert sugar (grape sugar) was added. Red coloring appeared then in great abundance. The large amount of red coloring in Alpine plants is conclusive evidence that they produce more sugar than lowland plants, and they would, therefore, be likely to secrete more nectar.

Since, therefore, according to evidence supplied by many investigators, plants secrete a greater amount of nectar at a high than at a low altitude, and since this view is substantiated by the presence of a large amount of red coloring matter, further discussion of this point seems unnecessary. We may accept it as proven that a high altitude, up to at least 7,000 feet, is favorable to nectar secretion.

Latitude and Nectar Secretion

Let us next consider whether a high latitude is favorable to an increased secretion of nectar. With the exception of a rarified atmosphere essentially the same conditions as to a large amount of light and low temperature prevail in northern as in Alpine regions. The many hours of daylight permit the plant to manufacture food for a much longer time than further south. Experiments in illuminating plants with electric lights show that they do not require a rest at night, and that with more light they can be forced to do more work. In the spring and early summer, and in late autumn, the nights are colder than the days. This is often also true of nights in midsummer. "The north," says Sladen, "is particularly well adapted for beekeeping, as the warm days and cool nights favor nectar secretion, while the long working day increases the crop. In favorable seasons 200 pounds of clover honey per colony is common near Lake Temiskaming. At Roberval, on Lake St. John, Quebec, an average annual colony yield of 200 pounds is obtained from alsike and white clover." (In MS.) In the case of no honey plant is the effect of latitude so well shown as in white clover. In Michigan, Wisconsin and southeastern Minnesota it is a very reliable honey plant. (See American Honey Plants, p. 277). A beekeeper in Fillmore County, Minnesota, writes that a complete failure of white clover has not been known in that locality for 20 years. It is a much better honey plant there than in either Illinois or Iowa, where good crops of honey are secured on an average only about 2 years out of 3. Farther south, white clover is a very unreliable source of honey, although it may occasionally yield a large surplus. Undoubtedly the goldenrods are far better honey plants in Canada and New England than farther southward. The wild raspberry in Michigan, Hutchinson says, never fails to produce honey, and he has seen bees working well upon it, when the weather was so cool that clover would not yield a drop of nectar. No plant was known to him which yielded more



Field goldenrod. A species which blooms early and does not yield nectar freely

honey in a season than great willow-herb (**Epilobium angustifolium**), in northern Michigan, but farther south, in Tuscola County, where it was also very abundant, it did not yield a pound of honey. The northern climate, and perhaps soil, were required to stimulate nectar secretion. For four consecutive years a good crop has been obtained at Melford, northern Saskatchewan, mainly from willow-herb. This plant will yield nectar with a cold wind blowing from the north that would stop all storing from basswood and white clover. Willows, blueberries, Labrador tea and asters all yield well in the North. High altitude is evidently favorable to an increase in nectar secretion. But the number of species of flowers in Arctic lands is much less than in Alpine regions; for example, 60 genera of plants are known in the Alps which do not occur north of the Arctic Circle.

The Effect of Intense Light

Soils and rainfall are undoubtedly important factors in determining nectar secretion, but as they are common to the lowlands as well as to Alpine districts; and to the tropics as well as to northern regions, they will not be considered in this paper. It may be well, however, in passing, to say that according to Prof. Fernald, the distribution of Alpine plants on the mountains of New England and eastern Canada is determined by the composition of the soils, according as they are derived from rocks containing potash, lime, or magnesia. Two factors of great importance in both mountainous and northern areas are light intensity and low temperature, and to these we shall confine our attention. The secretion of nectar is closely related to the amount of light the plant receives. The force or energy required for the manufacture of food material is furnished by sunlight. It is the power which drives the plant, just as the electric current is the power which drives the motor. Deprive the plant of light, and the sugar reserves will soon be consumed and nectar secretion will cease. Kenoyer placed buckwheat flowers under both light and dark jars, and after two days the amount of sugar in the nectar of the flowers under the dark jar began to decrease. After four days approximately only one-fourth as much sugar was secreted per flower. He obtained, also, the same results by covering the leaves of the plant with black paper. The flowers of cucumber, snapdragon and sage all secreted less sugar in darkness. If, however, the flowers were placed in the dark, and the leaves remained in the light, the amount of sugar in the nectar did not decrease. The secretion of nectar is thus dependent on the food reserves made by the leaves. Darwin observed that the extra-floral nectaries of the common vetch (**Vicia sativa**) ceased to secrete nectar when the sun was hidden by clouds, and the hive-bees left the field, but as soon as the sun broke out again they returned to the feast. (Cross and Self-Fertilization, etc., p. 403).

The force of the sun's rays on the top of Mt. Blanc (15,752 feet) is 2[illegible] times greater than at the level of Paris. At an altitude of 8,510 feet the chemical activity of the sun's rays is 11 per cent greater than at sea level. The greater intensity of the light drives the machinery of the plant more rapidly and more food is made. The first stable, or the main product formed is a sugar. If during the daytime more sugar is formed than can be used, it is stored in the cells as starch. During the night the starch is again converted into sugar. There is thus available more material for the production of flowers and nectar than in the plains. That Alpine plants contain a larger amount of sugar is shown by the abundance of red coloration or anthocyanin they produce. As already has been shown, this is formed only in cells which have a cell-sap rich in sugar. Too intense light is injurious, and the role of red coloring may be to absorb a part of the sun's rays. Light is also a direct stimulus to the growth of flowers. In the giant cactus, where the flowers

form a ring around the stem, they open first on the side toward the sun. In the shade the colors of many flowers are paler than in the light. The flowers of the chickweed will not open except in light, and some other flowers develop imperfectly in darkness.

The Effect of Low Temperature

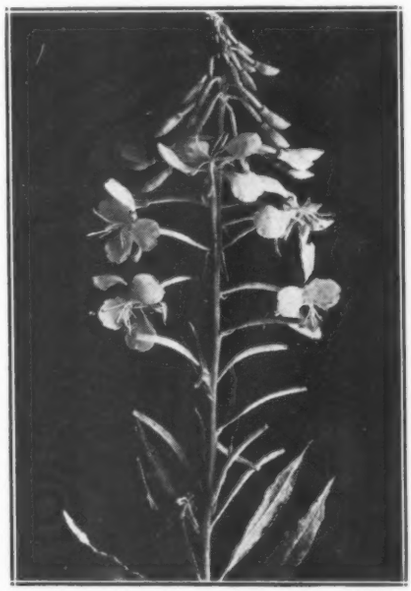
Numerous chemical analyses show that sugar accumulates in plant tissues at low temperatures. When the surrounding temperature is below 50 degrees F., sugar accumulates in potatoes and in various parts of plants. Kenoyer found that the leaves of white clover had 30 per cent more sugar and the flower-stalks 58 per cent more sugar at 50 degrees F. than at 77 degrees F. Ten flowers of alfalfa, after being kept in a temperature of 50 degrees F., for four days, contained a third more reducing sugar than 10 flowers kept in a temperature at 61 degrees F., for the same length of time. In explanation of the accumulation of sugar it has been suggested that starch is converted into sugar more rapidly than it can be used by the plant at a low temperature. If a warmer temperature follows, as when a warm day follows a cool night, nectar secretion is greatly stimulated, since there is a surplus of sugar available, and the warmth renders the membrane of the nectary more permeable.

It is well known to beekeepers that cool nights and warm days are more favorable to nectar secretion than a uniform temperature. According to the 29-year record of honey production at Clarinda, Iowa, the largest amount of honey was stored on days having the widest range of temperature. The early goldenrods, in northern New England, as the early goldenrod (**Solidago juncea**) and the field goldenrod (**S. nemoralis**) which bloom in July, when the nights are warm, yield little nectar; while the late goldenrods, which bloom when the nights are cold, as the tall, hairy goldenrod (**S. rugosa**) and the bushy goldenrod (**S. graminifolia**), are the source of a large surplus of honey.

In the Alps and in all mountainous regions the nights are much colder than the days. As we ascend a mountain the air grows thinner, or less dense, and at a height of 3.5 miles the pressure per square inch is only one-half as much as on the earth's surface (14.7 lbs.). It also contains much less water vapor. Water vapor acts as a great blanket to the earth's surface and vegetation. If the amount of vapor is small, the temperature will fall rapidly. Hence the cold nights at Alpine heights. Dry air is not sensibly warmed by the sunlight passing through it, but if it contains much water vapor its temperature rapidly rises, but the soil receives less heat. In the daytime the earth at high altitudes receives a large amount of sunlight, which the soil absorbs in a much greater degree than does the air. Thus on a clear September day, in the Pyrenees, at a height of 9,400 feet when the air was at 50 degrees F., the soil was at 91 degrees F. The warm soil raises the temperature of the layer of air in contact with it so that the dwarfed plants of Alpine heights find both soil and air very much warmer than at night time. As has been pointed out, this wide range of temperature is favorable to nectar secretion.

Contrast Between Alpine Vegetation and Flowers

The profusion of Alpine flowers is not accompanied by a luxuriant vegetation, as perhaps might be expected, for the leaves and stems are small, stunted, and poorly developed. The trees are often dwarfed and gnarled, with spreading, twisted branches, forming impenetrable scrubby growths. The shrubs are low and prostrate, the branches of the willows nestling close to the ground. The



Blossoms of Fireweed or willow-herb

herbaceous plants do not produce long stems, but great numbers of short tufted stems, or else matted growths. The leaves are also smaller than those of plants growing in the lowlands. The dwarfing of plants at high altitudes is due to various causes, as the severity of the storms and the winters, the cold nights, the low temperature of the soil below the surface, the excessive evaporation of water due to the thinness and dryness of the air and the intense light, and the difficulty of absorbing moisture from the soil.

In general, throughout the plant world, a check in vegetative growth, or of the foliage and stems, favors the production of flowers. The girdling of an apple tree hastens its blooming, and the same result may be obtained by root-pruning. Many cultivated vegetables, growing in a damp, rich soil, do not flower as early as when grown in a dryer soil. A check in vegetative growth renders a larger amount of food available for the production of flowers. The dwarfing of Alpine plants, which is the result of the general conditions at high altitudes, probably, therefore, favors the production of more and larger flowers, and a more ample secretion of nectar.

SELECTING A LOCATION

By L. H. Cobb

There are places where conditions are especially favorable to the beekeeper and where honey is a big crop every year. There are plenty of good locations, in these districts, yet to be taken up, but most of us want to keep bees where we are, if we can do so with any assurance of success. The average honey production of the various States with the exception of one or two is about the same. It has been improving in many States, as sweet clover and alfalfa have become generally grown. Even without these there has been a fair production in most places. It is not so much a particular part of the country as the particular spot chosen. One location will be extra good while but a few miles away we may find nearly every year a failure.

A good location is not very hard to find if the conditions needed are considered. White clover, sweet clover and alfalfa are three main sources of supply. Basswood, heartsease, buckwheat, Spanish needle, and some other nectar yielders, may be sufficiently plentiful to help out greatly, and in some localities special plants native of the country, such as the red raspberry of the northern cutover lands and the mesquite of the southwest, will make these places especially good, but the clovers furnish the main honey supply for a large part of our land.

While we have had only one year here, from my experience with similar locations elsewhere I am sure it will prove a good place. We have no great supply of white clover, yet it is scattered well all around. Sweet clover is quite plentiful along the roadways, though I do not know of a field where it is grown for hay or seed. There are several fields of alfalfa of small acreage around us, and timbered creeks each way within a mile. Several home orchards are close, with about two acres of fruit trees on the farm. There is no low land that I know of within three or four miles, so we have no wet soil plants to depend on.

One year I had my bees close to a large swampy field where the grain stubble soon showed green and pink with heartsease, and nearly every year the bees found nectar here to send them into the winter full up with honey and with a force of young bees to winter over. That swampy ground was an asset, and timber is also. The timber starts them off early and the heartsease carries them late, though we cannot depend on heartsease on uplands, as it does not yield nectar in dry years. Buckwheat can be sown freely to help out, but if we get a dependable natural flow, it makes our location better. Be sure you have the standard sources first, and then look out for these special sources. Kansas.

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THE EDITORS' VIEWPOINTS

Worker Mated With Drone

With reference to the note on the above subject in our October issue on page 415, Axel Holst, of the Virgin Islands, calls our attention to the fact that Cheshire (Vol. 1, page 239) mentions a similar case which was scientifically substantiated. While it is probably a rare occurrence this indicates that it is not impossible.

Beekeeping Damages From Germany to Belgium and France

We are officially informed, by Belgian authorities, that they are at last securing some bees from Germany, to partly make up for the apiaries devastated in the great war.

Belgium will secure 3,375 colonies in straw skeps, and France 20,000. They are to weigh between 15 and 17 kilos (33 to 37 pounds). We understand that the agreed value of these is to be credited against the amount of damages to be paid. Right! If they could make Turkey pay the Armenians in the same way!

Fertilization in the Honeybee

We acknowledge receipt of a copy of No. 2, Volume 31, of the Journal of Experimental Zoology, containing a very exhaustive and scientific article upon the above subject. Geo. H. Bishop, of the Zoological Laboratories of the University of Wisconsin, gives a wonderful description of the reproductive organs of the queen and drone, with anatomical cuts and plates.

It is out of the question for us to do the subject full justice; we are not sufficiently versed in microscopic investigations to go deeply into this matter; neither would the average reader be interested in the details. But there are a few points in this study which we ought to mention.

The study quotes 8 different authorities on queen fertilization, none farther back than 1882 (S. A. Shuck, in American Bee Journal, 1882, page 789). Huber made numerous experiments, from 1787 to 1812, upon the mating of queens. He also quoted at length some very interesting experiments and engravings from Reaumur (Quarto edition, 1740). As a matter of course, neither of these observers had the modern facilities for microscopic studies, and especially for magnified descriptions, yet it is remarkable how closely they came to the modern studies.

Huber's "Nouvelles Observations," the last edition of which was published in Geneva in 1814, were translated into English but, strange to say, some of the most interesting descriptions of the study of fertilization were entirely omitted in the English translation. Huber's second letter to Bonnet, mentioning a number of facts on this question, and which contains 36 pages in the French edition, had but 3 pages in the English edition of 1821.

The present description of the organs, in fertilization, mentions a point in which Huber did not agree with his renowned predecessor, Reaumur. Mr. Bishop tells us that, in mating, the penis of the drone and its "bulb" are everted (turned inside out) from the drone's body into the vagina of the female; that "the penis is gradually forced out from within, as one might force out a glove finger that had been turned inside out in stripping it off, by blowing into the wrist of the glove."

Huber, on this same subject, quotes Reamur as follows: "When we press the belly of a drone gradually, with care, we cause other parts also to be ejected; these parts show themselves on the opposite side from their position in the body. The surface of these parts, which was the inside, becomes the outside; the same thing happens to them as to a stocking which is drawn inside out. If the opening of the stocking which we turn inside out was fixed upon a hoop, and if we began to evert it by beginning at the part nearest the opening, so that the heel and toe came last, we would have, in this eversion of the stocking, an exact illustration of the manner in which the organs of the male bee are turned to project outside."

Huber held that this eversion of the organs of the male does not take place to so great an extent, if at all, when his organs are exuded in natural circumstances, as when forced out by pressure. He wrote:

"When we examined the lentil" (called by our modern observers the bulb of the penis) "of which the queen had rid herself, we saw clearly that it had not been everted, since the side of it which we saw was the same as what is seen within the body of a male; we recognized this by the position of the 4 scaly plates" (that cover the lentil or bulb) "which exhibited their convexity and which covered the lentil and its posterior end; had they been everted, the contrary would have been the case."

Thus Huber held that the organs of the drone do not extrude in the same manner, when they are naturally thrust out in copulation, as when they are forced out artificially in the manner well-known to all beekeepers who have ever handled drones.

We see by several statements of Mr. Bishop, that he is himself in doubt as to the complete eversion of the male organs, as described by Reaumur. He also quotes Zander as stating that the eversion of the male organs "extends to the median bulb," which is that part of the male organ that Huber calls the "lentil."

So we realize, once more, how careful Huber's observations were. He made hundreds of experiments upon the fertilization of queens, and his descriptions are not based upon isolated facts, but upon a succession of experiments in which he accepted only those that reproduced themselves several times over. It is to be regretted that his works were never published entirely, in English. Our editor, at the request of a number of interested beekeepers, has undertaken a literal translation of them and hopes to be able to publish them in a year or so.

One important and very practical fact which Mr. Bishop has elucidated is the age at which drones are fit for mating. It appears that they are not fully mature until they are at least 5 days old, and are still better at the age of 9 days.

Our sincere compliments are extended to Mr. Bishop for this contribution to scientific knowledge on the mating of bees.

Do Bees Hear?

Mr. Tichenor's article in this number on the above subject is exactly in line with the arguments furnished by Cheshire, author of "Bees & Beekeeping." He wrote:

"Should some alien being watch humanity during a thunder storm, he might decide that thunder was to us inaudible. Clap might follow clap without securing any external sign of recognition; yet let a little child with tiny voice but shriek for help, and all would at once be awakened to activity. So with the bee: sounds appealing to its instincts meet with immediate response, while others evoke no wasted emotion."

Our scientists have been unable to positively ascertain the location of any ears in the bee. But we know that their different sounds are recognized promptly by them. Huber wrote some very interesting statements on this subject and we expect to give them to our readers in the course of a few months.

American Honey Producers' League

The League will meet at Salt Lake City, January 30 and 31, 1922. It is of great importance that each state or district association be represented at this meeting, if we expect to have combined action in the sale of our products and wish to be heard on matters of interest to all beekeepers, such as railroad rates, laws, etc. Don't forget this meeting. For additional information write H. B. Parks, Secretary, of San Antonio, Texas.

Georgia to License Queen Breeders

The State of Georgia has adopted a rather novel method of supervising the business of queen rearing and package bees. An amendment to the Georgia bee disease law was adopted at the last session of the Legislature which goes into effect the 1st of January, 1922, providing for a license to be issued to all persons engaged in such an enterprise. Application must be made to the State Board of Entomology with a fee of $25. The Board, after investigating the applicant, may issue a license, if he is found worthy. The license may be revoked at any time if the applicant fails to comply with the law or the rules established by the Board.

This looks like a step in the right direction. There has been much complaint of irresponsible breeders, and a careful supervision seems to be the only way to safeguard the interests of the public. If the Board sets a high standard it will be to the interest of every breeder as well as to the interest of their customers. In most of the States similar supervision is established for nurserymen to insure that no trees or vines will be sent out which carry insect pests or plant diseases. Some will regard the fee as too high.

We hope that the regulations of the Georgia Board of Entomology will not only insure that every breeder must maintain his yards free from disease, but that pure matings must also be insured as far as such a thing is possible, and that business-like methods of attending to correspondence and filling orders be followed. This will, of course, make queens a trifle more expensive.

Drugs for Treating Foulbrood

We would call the attention of our readers to the article on the Lewis treatment of European Foulbrood, by W. J. Sheppard, in our November issue, and to the comments which Arthur C. Miller adds in this issue. Let us add that this method of treatment is still in the experimental stage and while these reports look promising, it is too soon for the average beekeeper to risk any extended dependence upon drugs. General Laboratories, the manufacturers of B. K., advise us that their experiments have not as yet gone far enough to warrant them in asserting that the colonies can be rid of disease without disastrous results to the bees. They state that some special form of the hypochlorite may, and probably will be, necessary to make it safe to recommend for general use for this purpose.

We are further advised that most sodium hpyochlorites differ widely in their characteristics and effects and that different forms might give very different results. This being the case it would be difficult, if not impossible, for the beekeeper to make a solution twice alike. Again it should be used with great care, since some forms have characteristics which are likely to cause injurious effects.

While we are hopeful that good results will follow the experiments now under way, beekeepers should be advised to act cautiously and not undertake any treatment in a wholesale way without first making sure that the chemicals are properly prepared. It is only necessary to state that should this treatment prove entirely successful, the proper material will soon be available to the beekeepers in a convenient form. In the meantime we will watch with interest the progress of further experiments.

That Prize Contest

Letters regarding the prize contest announced in our November number began coming in at once. What we want is to know what particular feature of the last year's Journal was most interesting and valuable to you. We are not asking for articles for publication, but your frank opinion. We want to make a better publication, so let us know what kind of material you like best. Read the announcement on page 437 of the November number and write us. You may win the $10. Address Contest Editor.

Bees Transporting Eggs

Mr. A. H. Pering, Secretary of the Monroe County, Indiana, Beekeepers' Association, reports two cases of queens accidentally confined several days in cages, in colonies that were otherwise hopelessly queenless, the queens dropping the eggs in empty cells and caring for them, so that they hatched.

Have any other beekeepers noticed such performances? In every case where eggs were found in cells, in queenless hives, in our experience, these were laid by drone-laying workers and hatched into drones. We do not believe that either Huber or Langstroth ever witnessed anything of this kind.

What is the sex of eggs dropped aimlessly by a queen? This question has never yet been elucidated.

We read in the British Bee Journal of October 20:

"Fellow readers will remember the report, giving us the information re that veteran apiarist, Mr. T. W. Cowan, being present at a very important gathering, I believe the first time he had spent the day away from his wife on the anniversary of their wedding, and that was drawn to the notice of the gathering; it was the golden wedding anniversary, though nobody seems to have referred to it in the numerous and interesting contributions; doubtless all are with me in wishing Mr. and Mrs. Cowan many more happy returns of the day."

Here, too; the editor and the readers of the American Bee Journal join in wishing Mr. and Mrs. Cowan "many happy returns of the day."

To the Various Beekeepers' Associations

You are all aware of the subscription organized to establish a memorial of Dr. C. C. Miller, in view of the numerous services he rendered to beekeepers, without ever enriching himself.

The committee in charge is composed of Messrs. E. R. Root, Dr. E. F. Phillips, B. F. Kindig, E. G. LeStourgeon and C. P. Dadant. At the suggestion of Dr. Phillips, it was decided to establish a memorial bee library and place it in one of the Colleges of Agriculture, probably the one that would offer the best inducements for it.

Several bee associations have subscribed liberally to this fund. The committee now suggest that each Secretary or President of an association present the matter at your next meeting and help make this memorial worthy of the great man whom it will represent in future years. Even foreign beekeepers have appreciated the services of Dr. Miller and have sent their help. But we should get together a worth-while sum, and trust each of you may take pride in helping this along.

Associations already having subscribed through the American Bee Journal are, Montgomery County, Pa., Wisconsin, Connecticut, Massachusetts and Texas.

All subscriptions will later be published in the American Bee Journal.

Southern Italy Beekeepers' Convention

"Allevamenti," a stock breeders' journal, of Palermo, Sicily, in its October 1st number, reports the meeting of the First Meridional Congress of Beekeepers, in Palermo, September 22, 1921. In this Congress, great stress was placed upon the importance of the industry of beekeeping in the United States, and the necessity for Southern Italy to increase the cultivation of bees in its meridional parts. The same magazine contains a very interesting description of an experimental station for beekeeping in Bavaria, managed by Dr. Zander, with cuts of apiaries of different sorts.

Latham Gets Publicity

Allen Latham, President of the Connecticut Beekeepers' Association, is getting some free advertising. At some eastern meeting he got off some kind of a joke about bees and prohibition. A wide-awake reporter saw material for a good story, and now Latham's name may be seen in most any paper which you pick up, from Arkansas to Maine. The story quotes Latham as saying that prohibition has reformed the bees that formerly hung around the breweries and got drunk on the mash. There are several different turns to the story, as it appears in different localities, but it is all based on the bees getting drunk at the back door of the brewery.

SELLING THE HONEY CROP

Pointers from Fifty Years of Personal Experience in Selling Large Crops.—By C. P. Dadant

I HAVE read somewhere, lately, the statement of a honey dealer, "that the selling cost of honey will run at least 100 per cent over that of production." Probably it does, and that is an argument in favor of the beekeeper selling his honey himself, for in many cases he is not very busy at the proper time for honey sales. But not all beekeepers do it.

Perhaps, in order to show how one may succeed in selling one's crop, I had best give an account of my early experiences, which resulted in our success in honey sales.

In the previous number of this journal, I narrated my disgust and disappointment at the slight given to my fine extracted clover honey, water white, by the first man to whom I offered it. This, however, did not permanently discourage me. I am rather of a tenacious disposition, and faulty opposition makes me more obstinate. A man is very strong, when he knows that the goods which he offers are as represented. However, for 3 or 4 years, we sent a part of our crop to commission men in Chicago and St. Louis. Our experience with Chicago was at the time of the Chicago fire, 1871. Luckily, the commission man to whom we had sent our clover honey had sold it and made returns before the fire. We brought the fall honey to the railroad station, to be sent to him, on the day of the fire, and the railroad company refused it. This saved us a loss, as the man went into bankruptcy.

In 1873-4-5, we made exhibits at the Iowa State Fair, which took place at Keokuk, 4 miles from us. This brought so many sales that we became convinced that honey could be disposed of locally, if only we became known as honey producers. We took first premiums. I doubt that beekeepers in general realize the great profit which their business may secure from such advertising as can be had at State Fairs. It is true that it costs money, but if you accept the statement contained in the first paragraph of this article, the expenditure of $50 or $100, for an exhibition, is but a small matter, if you have 5,000 to 10,000 pounds of honey to dispose of. Only a cent or two per pound is a trifle when you consider the increase in price that you may secure. Besides, the results of such advertising last a number of years, even if you have exhibited at only one or two fairs. Local fairs, county fairs, are good in the same proportion, and the expense is less.

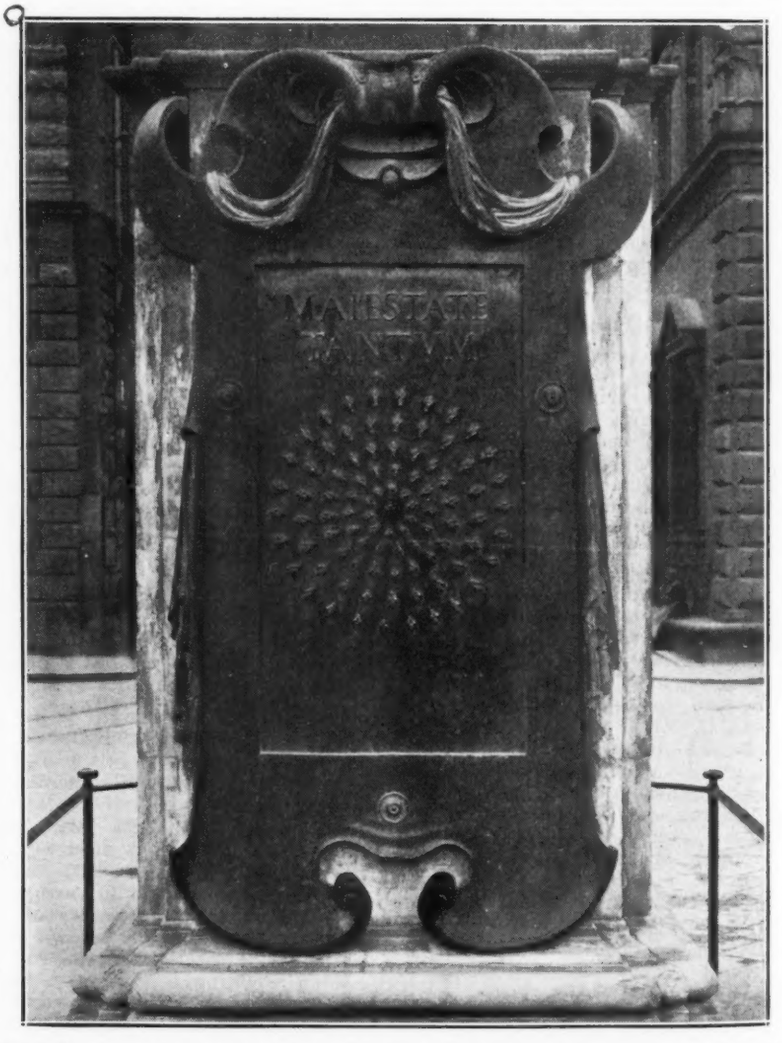
What is worth doing at all is worth doing well. If you exhibit honey, it must be fine, in looks as well as in taste. My best winning exhibit was that of 3 Quinby-Dadant full-sized frames of white honey, staged in a home-made show case, one behind the other, so that the first comb concealed the bottom bar of the next, and the second concealed that of the third, making tiers covering about 30 inches in height. People stopped and asked questions; that was the only requirement to help sales.

I believe we were the first to put up honey in 10-pound tins. Those holding a gallon were too large; so we had our tinner make such as are now used, except that we did not then have the improvement of the "friction-top" and the lid fitted over the top of the pail. We aimed to sell all the honey in granulated form or to warn the customer of the likelihood of its granulation.

My first real active sales of extracted honey were in that shape. One small grocer took 120 ten-pound tins in one winter. But he had visited our apiaries while we were producing the honey and had seen us extracting, and he **positively knew** that Dadant's honey was all right and did not hesitate in guaranteeing it. That is a great point.

Then came the demand for smaller packages, to my great sorrow, for the smaller the packages are, the more sales you have to make for a stated amount of honey. But when I called upon the grocers, I was glad to be able to supply packages as small as a single pound. It is an unfortunate thing that the consumer who can least afford it, buys his supplies in the most reduced shapes. The day laborer, who gets his pay envelope at the end of the week, is not wealthy enough, or does not think he is wealthy enough, to buy a whole hundred-pound sack of sugar, or a 60-pound tin of honey at one time. Yet he is the one who needs to buy in large lots, so as to get his food supplies at the bottom figure. But it is useless for us to deplore this, since we cannot help it. We must supply things as demanded.

Nothing did me more good, on honey sales, than a friendly lecture from a drummer of wholesale groceries. He explained to me, at length, the necessity of convincing the retailer, by all possible means, of



Monument on a public square in Florence, Italy, showing swarm of bees on a pedestal of the statue of Ferdinand De Medici. (Courtesy of Sig. Ugo Lori).

the quality and genuineness of my product. He taught me that grocers and buyers in general must be properly interviewed, when they are not too busy to listen, and when they are in good humor. He also explained that many people fail to sell goods because they at once take "no" for an answer, that nine-tenths of the customers are apt to change their minds when properly and pleasantly interviewed. A very fine customer of mine, at St. Louis, one of the best retail grocers there, proved this statement and regularly gave me an object lesson, unconsciously; for after having heard and appreciated the advice of my drummer friend, I resolved to follow it and "hang on." Well, this grocer would invariably discourage me when first interviewed; he did not want any more honey, he had too much trouble selling it; it would occasionally leak on his counters; his clerks did not know how to recommend it; he had a thousand objections. Sometimes I would leave him for a few hours and come back and try again. It was all in pleasant conversation, as if honey were only an incident of the visit. Slowly his arguments would lessen and he would usually end by giving me an order for a ton or more, in all sizes of packages. This would happen in the same way, more or less, every year, and it usually took a whole day, but I made the sale; it was worth while. He was always sure that he secured the lowest price that I would be willing to make.

Most grocers are good men to deal with. But we must convince them that our goods are pure, that they are cleanly put up, that they may guarantee them to their customers, and that we will gladly take back any goods which have the least defect. I remember taking back one tin of honey, because a fastidious lady had found a bee's wing in it.

When this matter is thoroughly understood, there is but little difficulty in selling honey. Honey! Who says there is anything better than honey? All we need, to secure sales, is to convince the people of its purity, and this can be done if we only try.

We always exchange any shop-worn goods for fresh ones, with the customer who sells our honey. A soiled label makes the package unsaleable. Put yourself in the retailer's place and treat him right.

Advertising.—This does not always cost large sums of money. One of our leading educators whom you all know, told me of his own father selling thousands of pounds of honey, right at his home, because his apiary is along one of the most traveled highways in the United States, and he has a little sign, close by the apiary, of "HONEY FOR SALE." He has to buy several tons of honey to supplement his own crop. The hives of bees do the advertising for him and the traveling public, of course, takes it for granted that those bees produce honey. If we could take a hundred colonies of bees with us when we sell honey, we would sell ten times more.

Our largest local sales began after a meeting of the Warsaw Horticultural Society, at our home, in 1884. This Society was next to the State Horticultural Association, in importance, though only a "local." They met successively at the homes of their members, for practical demonstrations and lectures. For the meeting in question, they had secured the services of a leading horticultural lecturer, Mr. Periam, then editor of the Prairie Farmer. We had not given a thought to the possibility of this meeting being good advertising for us, although we had agreed to do some honey extracting before the members and give an apiary demonstration. Fortunately for us, a live business man of Keokuk, a city of 14,000, urged the merchants of the city to attend this meeting, saying that they would be well repaid for their time. We had a throng, not only of Illinois horticulturists, but of merchants in all sorts of products, some 500 people; and our apiary and our extracting were the town talk for several days. Most of these people saw something entirely new to them, and spread the information voluntarily and cheerfully. It was a great success, and we had not foreseen the results in increased sales.

I am telling this, simply to show what good may be done by judicious advertising, sometimes with little expense. If you have the honey, if you put it up in attractive shape, very clean, of proper sizes for the demand, and if you hustle a little, you can sell tons and tons of it, at profitable prices. It is true that not all can do it, because not all are located where it is possible to reach the customer. Beekeepers in the localities where every acre is a honey producer, where cities are scarce, must use other means of advertising. I will speak of this a little farther.

We need a good label, but to me a good label is not necessarily an expensive one. It must exhibit the word "HONEY" in large letters. My reasoning is that people do not go to the grocery to buy honey as they go to buy butter, potatoes, sugar, flour, eggs, etc. This is because honey has never been plentiful enough to be always on the grocer's shelves. But America consumes fully 40 pounds of sugar for every pound of honey, and everybody knows that honey is the best of sweets. They need to be reminded of the existence of honey. How many people buy honey regularly? One in a hundred? Hardly. That is why a showy "honey" label does better work than an ornamental one in which that word does not show at sight. No need of putting a lot of printing on it. They don't read it. But we can enlighten them by handing to them some printed explanations, profusely illustrated, so they may become interested. This has proven a good thing on both sides of the Atlantic. Although granulated honey has a better standing in Europe than it has here, it is necessary, there as here, to explain that not all honey is alike, that the man who has eaten buckwheat honey must not think that clover honey is adulterated, or that basswood honey is made with some sort of lemonade, as suggested to me once. Until one goes about, selling honey, one does not realize the profound ignorance of the masses on the subject. If granulated honey is less appreciated here than in Europe, it is due to our own producers who, many of them, seem to be ashamed of their honey when it granulates. Yet no other product than pure honey possesses exactly this peculiarity, so it is an evidence of purity.

The beekeepers in the favored regions of large honey production, but who are at a disadvantage when they wish to sell it, need to use printer's ink, away from home, and organize in associations, to sell through a center, as they do indeed. But all beekeepers who have honey for sale, in any quantity, need the co-operation of others, not only in their locality, but in their State and in a country-wide organization, a National League, so they may learn the conditions of the crop, the prospect of the markets, the probable prices, etc. The lack of co-operation, in the old days, was the greatest drawback. Although we tried to get a general understanding with our neighbor beekeepers, some of them would inquire indirectly about our prices, in order to undersell us, claiming that they could not make sales unless they did so. It is a great mistake, for it forces prices downwards.

ITALY FEATURES THE BEE

We are indebted to Dr. Alberico Molinari for a small Italian coin with a honeybee sucking at a flower, shown on one side. The picture shown herewith reproduces the coin

Face of Italian coin showing honeybee

at very nearly exact size. The value is equal to about two cents in our money. We would like very much to know whether any other country has ever featured the honeybee on any coin, paper money, postage stamp or official documents. Information on this point will be appreciated.

DO BEES HEAR?

By J. H. Tichenor

The question, "Do Bees Hear?" page 399, is interesting. I have long ago concluded that they do hear, but admit that there is no positive proof. Let us make some comparisons among the animals and birds; do cows hear? Let me go out and call my cow, and if in hearing distance, she comes. Let any other member of the family call, and she will not move a hoof. Hence, the cow not only hears, but can distinguish voices. Do hens hear? They come from all quarters at my call.

Fig. 1.—Ivan Whiting's apiary

When a bee comes at you to sting, you understand her, don't you? She says plainly, "I mean to sting you." Still you don't run. She perhaps returns to the hive for reinforcements and gets them quickly. I imagine that she reports about like this: "Say, fellows, there is a man out there, stone deaf, and sting-proof; got to have help."

You are all familiar with the heavy hum of the drone. You also recognize the merry hum of the worker, in fair weather and good honey flow; also their wailing, moaning sound when in distress. Now is it reasonable to suppose that bees are given all these means of expression (which we call noises because of our inability to understand their language), and not be able to hear? I have lived among the bees too long not to have seen them do things which require thought on their part, and communicate them to their fellow-beings, apparently before the things could be accomplished.

It is all right to discuss this question among ourselves; but I am going to keep this matter from my bees, lest they may think that we are presuming too largely upon their ignorance.

Wisconsin.

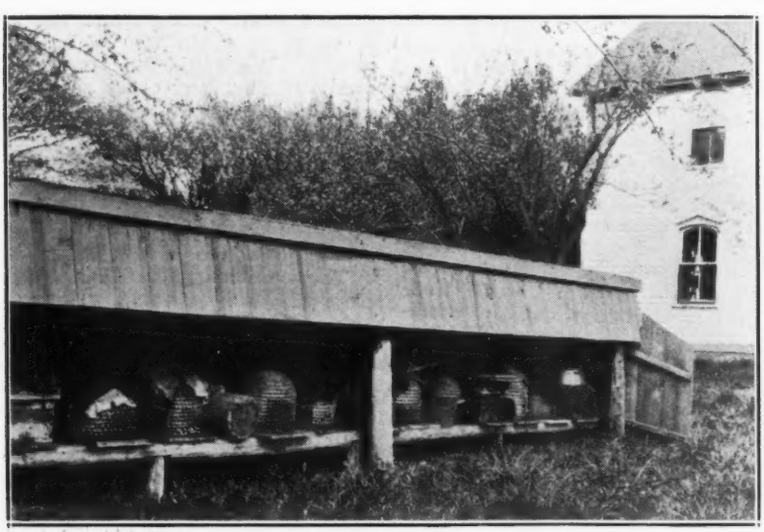


Fig. 3.—Mr. Kreiger keeps bees in the old way, straw skeps

GLIMPSES OF WISCONSIN BEE-KEEPING

Notes and Pictures Showing What Beekeepers Are Doing in the Badger State

By H. B. McMurry

The pictures on this and the following page will give an idea of beekeeping conditions in Wisconsin. These brief notes are designed to explain the pictures.

Fig. 1.—Yard of Ivan Whiting, Plymouth, Wis.

Mr. Whiting came to us from Illinois, and has established himself as one of the most progressive beekeepers in his section. He secures uniformly large crops, principally from white alsike and sweet clover and

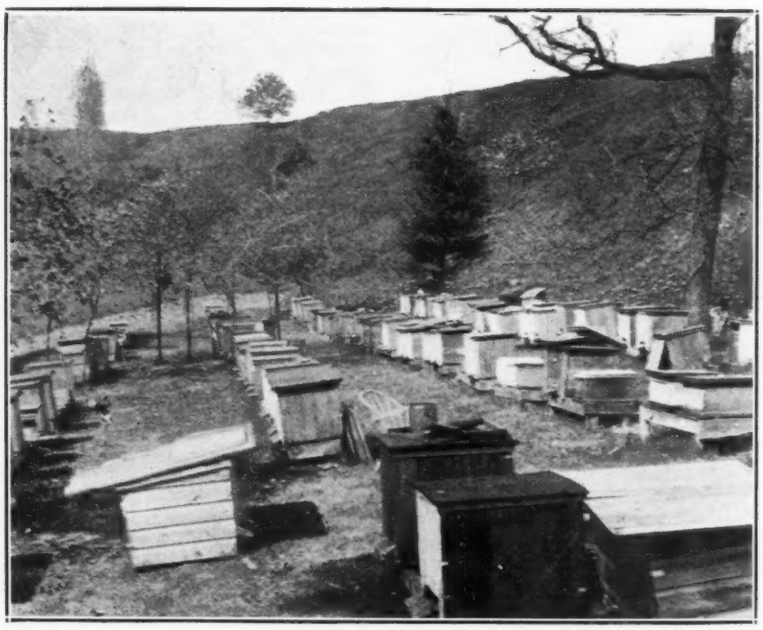


Fig. 2.—Sheboygan County apiary of L. T. Bishop

basswood. Aside from being instructor in the high school, he finds time to assist very materially in the organization work among beekeepers of his county, and this year spent considerable time as a deputy inspector. If Illinois has any more beekeepers of the Whiting "brand" she will please send them along.

Fig. 2.—The yard of L. T. Bishop, Sheboygan County.

The picture was made last spring. The packing cases are still on. Mr. Bishop is one of a group of beekeepers whom I designate as "paper packers." They use what is known as the Schmidt packing case, which allows for no packing underneath, except a few sheets of tar paper, only 3 inches around the hive with 6 or 8 inches on top. They leave the covers sealed on. The hive is wrapped in paper, usually 6 to 10 ply, and the packing material is loose planer shavings. This method seems to be very sucessful in the hands of beekeepers

Fig. 4.—The Eskil packing case

like Mr. Bishop, as it was with Mr. Schmidt, who worked out the system many years ago. These fellows laugh at the arguments put up by the "upward ventilators."

Fig. 3.—Mr. Kreiger's yard at Rio, Kewaunee County.

Mr. Kreiger keeps bees very successfully "the good old-fashioned way." As shown in the picture, he uses the straw skep. He claims that the bees winter better in these than in modern hives, and he proves it by his experience. During the winter the bees are stored in a small house, the walls of which contain about 6 inches of packing. Mr. Kreiger had a number of prime swarms in May. It is indeed interesting to find a bee-keeper who is making some success in keeping bees as they were kept hundreds of years ago.

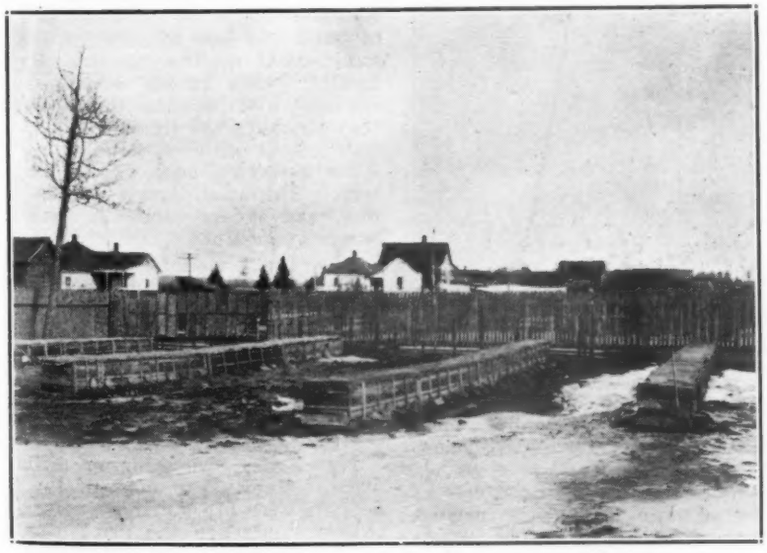


Fig. 6.—D. A. Blanchard's yard in Langlade County

Fig. 4.—The Eskils, of Iron Mountain, Michigan, wintering successfully out of doors.

The above packing case has been the abode of a thriving colony for the last eight winters. These people are among a large group who advocate "upward ventilation." They remove all covers, place several thicknesses of cloth, such as sacks, carpets and old coats, directly over the colony and then cover with a pack of sawdust or leaves. They came very near convincing me that bees could not winter in northern Wisconsin with the covers sealed on. Shortly after my visit to the yard, I had an occasion to see some of the bees in my Shawano County yard, and having found them very contented and dry in spite of the sealed covers, I decided to investigate further.

Fig. 5.—A corner of the yard of Julius Gentz, Wabeno, Forest County, Wis.

Mr. Gentz has made beekeeping his chief occupation for many years. He had 260 colonies this season. He winters some of them in cellars. For many years he has wintered 60 colonies in packing cases as shown above. He uses quadruple cases with no packing underneath the hives, except tar paper and only 3 or 4 inches of leaves around the hives and 6 or 8 inches on top. Mr. Gentz is a member of the group of "upward ventilators." He is in a section which produces very fine crops of honey from wild raspberries and fireweed, as well as occasional crops from clover and basswood. He claims that experience demonstrates that bees wintered out of doors build up faster in the spring. This, no doubt, is accounted for by the protection which the packed colonies have during the spring.

Fig. 5.—Forest County yard in winter cases

Fig. 6.—D. A. Blanchard's yard at Antigo, Langlade County, Wis.

Here the colonies are placed side by side, each alternate pair facing opposite directions. The covers are left sealed on. The packing is planer shavings and 6 inches underneath, on the ends and top, all enclosed in roofing paper. An examination in March revealed that these bees had wintered in very fine condition. There was no moisture present, nor any other indications of poor winter conditions.

Fig. 7.—At Laona, Forest County, Wis., I found Mr. G. J. Guenther wintering bees very successfully in a large, well-lighted cellar, one part of which was used for a work shop. The picture shows a large box in which 8 colonies are wintering. They are kept

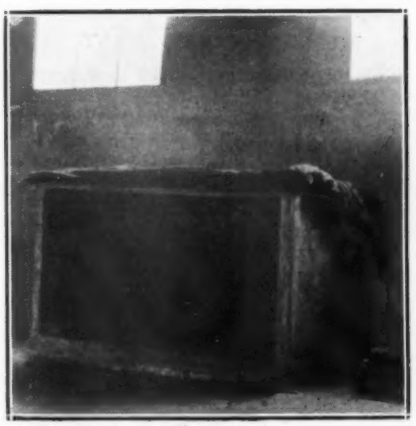


Fig. 7.—Bees in box in well lighted cellar

in the dark by the cloth cover on the box, which also serves to help keep them warm when the cellar is too cold. He has practiced this method for a good many winters and finds it very successful.

THAT NATIONAL TRADE-MARK

Several months ago it was proposed that a trade-mark be established for the American Honey Producers' League. I agreed to design such a trade-mark, provided the beekeepers of the country would give their support in suggesting what this trade-mark should consist of.

The matter was given considerable discussion in the editorial columns of the bee journals, but our busy beekeepers probably did not heed the matter or give it serious thought. only two or three suggestions were offered during these past months.

While I have my own ideas in the matter, yet the question of a trade-mark affecting the honey industry of the nation, cannot be decided or suggested by one person.

Many trade-marks now existing, used in connection with honey, have embodied in them one or more honey plants. I feel that honey plants should be omitted entirely from the trade-mark. It is entirely impossible to name a honey plant that is a major source of surplus honey in every State in the Union.

To design a suitable trade-mark that will be adaptable to the entire country, is quite a task. Will you please offer your suggestions?

C. W. Aeppler.

Oconomowoc, Wis.

It is vitally important that the American Honey Producers' League adopt a trade-mark for future advertising campaigns. Now is your opportunity to suggest ways, designs and wording for your trade-mark. Take advantage of the opportunity and send your suggestions to Mr. C. W. Aeppler, who is a practical beekeeper and artist.

This League is your League; use it and benefit by it.

C. F. Muth,
Chairman Advertising Committee, American Honey Producers' League.

FROM THE FAR WEST

The west is not so wild any more, but there is still plenty of room out there. An extension man has to travel long distances and visit widely separated localities. Beekeeping is quite generally concentrated in favorable situations in the valleys while there are large areas which at present would not support honey production on a profitable basis. H. A. Scullen was one of the first beekeeping specialists employed by an agricultural college on the Pacific Coast. Although he had formerly lived in Oregon, he was a member of the faculty of the Iowa College of Agriculture when selected for the position of beekeeping specialist for the Washington State College at Pullman. After several years of successful work in Washington he resigned to accept a similar position at the Oregon College, where he is still stationed. Scullen is well known to the beekeepers of the west and we take this opportunity to introduce him to our readers of other sections.

SELLING HONEY

By M. P. Woodworth

I am not boasting that my method of selling direct to the consumer is altogether new. The main thing about it is that it works out for the products of my own apiary. Up to the present time I have sold 3,000 pounds of fine clover honey, locally. The honey is put up in five and ten-pound pails, one pound, one-and-one-half and three-

H. A. Scullen

pound jars, and attractively labeled. Every writer on the marketing of honey emphasizes the sale value of an honest label, and especially a label suggestive of the delicious sweet within its container. There must not be too much reading matter, as folks do not read all, especially the instructions regarding the care of honey after it granulates. One must talk a great deal, when conditions are ripe for talking. Bees and honey spell mystery to the average individual. Let the beekeeper expound the manifold mysteries of the hive and its occupants. A great deal of misunderstanding arises through lack of knowledge as to how honey is actually produced. Many a buyer is skeptical, he thinks there is something artificial about our honey. The fact that we have pure food laws and bee inspection does not dissipate his doubt. To sell honey one must establish faith in the purity of it. Only yesterday a physician inquired of me about comb honey. He said he would like a few combs, as he knew it was the real article.

To overcome such a state of mind I explain how honey is actually produced, and I always carry photographs of my apiary and small exhibits of extracting combs, fat with honey. It's a real pleasure to see the feeling of confidence that comes as a result of the pictures.

There is nothing I like better than to sell this finest of sweets. In fact, I am in love with honey. I have jars, pails and combs of it in conspicuous places about my home, where my eye can see and my mind contemplate its beauty. The presence of honey about the house serves another purpose—it keeps me enthusiastic over the work. Our frequent callers cannot resist buying, when they see such a tempting article.

As I live a short ways in the country, on an important highway, my large "Honey for Sale" sign across the driveway halts many an autoist. I also conduct a roadside stand, where I display my apiary products in the various containers. I spend a portion of each day in the city, with my Ford touring car, at an important street intersection where the traffic is thickest. I manage to stay between 11 a. m. and 2 p. m. Honey is in evidence on every available space in the car. I have two large honey signs, one on the back curtain and one across the lower portion of the wind shield. The upper portion of the wind shield is bent down at right angles to make a shelf, and across this shelf I place my jars. The rear seat is stocked full of pails and jars of honey; pails are hung about on the outside. So the passing public knows there is honey for sale, and because it is attractive they want it. At times I go into various offices with one-pound jars, and I am surprised how well the honey sells. The small jars serve as samples, and orders come in later for larger quantities.

I believe it would be wise to carry an observation hive somewhere on the car to attract attention and thereby stimulate buying. Extracting combs enclosed in glass to keep out dust would be an added feature. Someone might suggest why not move the whole apiary down? No, not quite that.

My honey is bringing a better price, I think, than most of the beekeepers here are getting. Fifteen to twenty cents are the prices for extracted honey. I am realizing from 22 to 25 cents for most of my honey. The buying public is willing to pay a little more for looks than some beekeepers realize.

Wisconsin.

CARNIOLAN BEES

I have your letter asking for my opinion on the Carniolan bees. The Carniolan bees have been tried and condemned again and again by a hasty jury. Their nature and efficiency have never been made a sub-

ject of thorough research, therefore, I hesitate to reopen the case.

I believe there are varieties and races in bees just as in chickens, cattle, or pigs, each race fitted for a different purpose, different climate, and different conditions, and to say that there should be just one race of bees for all the United States and that one is the most perfect everywhere under all conditions, is going against all experience in every branch of animal industry.

I took up the study of Carniolan bees two years ago. I imported my stock and bred from it and raised honey with it in a special apiary. I am just beginning to find out their characteristics and it may be several years before I will be ready to make any definite statements concerning them. It is impossible to enter into details at present. I mention only a few points, which apparently are coming to the front:

1. They are larger than other bees, and have longer tongues and can work on red clover.
2. They gather proportionately more honey per colony than other races.
3. They are the gentlest of all bees we have in the United States; absolutely quiet on the comb, not flying from the comb when handled, and we need no smoke when working with them.
4. They are hardier than black or yellow bees and can stand at least two degrees more cold.
5. On account of their quiet disposition they winter very well.
6. They hardly ever rob.
7. Their queens are so prolific that they are superseded in the early summer.
8. They cannot be kept in a ten-frame Langstroth and nothing less than Dadant size of hive will do.
9. Their management will differ radically from the management of Italian bees.

These are the lines along which I am working now, and I will be too glad to send you further information when, after longer and closer investigations I arrive at definite conclusions and can furnish proofs for the same.

Francis Jager,
Minnesota.

DECOY HIVES

By Dr. Ransom A. Race

Early in the spring I prepared some boxes with an old brood comb and placed them in trees in the woods. One of these was placed about a mile from my apiary on the 18th of May. The following Sunday a friend and myself strolled over to see if there was any signs of a bee about the box. The first glance showed six or eight bees flying about and my companion said, in a disgusted tone: "Blamed few bees around here." After watching them for a few minutes I became convinced they were "scouts" from some swarm then clustering somewhere in the woods. Filling our pipes we sat down under a nearby tree to wait developments. In a very short time every bee flying about the box left it; but in less than three minutes a slight buzzing sound was heard which kept increasing in volume and in almost no time the bees were seen coming down through the trees straight for the box, no time being wasted by them in taking possession.

As soon as nearly all were in, the box was closed and taken home and they were hived in a Modified Dadant hive, which they have filled with comb and about 25 pounds of surplus honey,and that, too, during a season that has been almost an absolute failure.

They are splendid Italian bees, as well marked as any bees I have in my apiary.

While this was taking place it was almost as interesting to watch the friend who was with me. Until then he had no interest in the bees, but, since then, his interest has grown until now he has bees of his own, and I really believe he has become as big a "bug" as I am.

Massachusetts.

HONEY PRODUCTION COSTS IN A SMALL APIARY

By Elmer Beach

Having just finished figuring cost on my honey production for this year, I thought you might be interested in seeing the figures.

My little apiary is composed of eight colonies, five in old-style Dadant hives, two in 10-frame Langstroth and one in 8-frame, all located here in my home garden within ten feet of each other.

The nature of stock investment, being of wood, and necessarily kept well covered and protected, and when that wood is covered thick with wax it is still less destructible, I finally decided that 5 per cent depreciation, same as on wood buildings, would be about right, instead of the 10 per cent allowed on most classes of equipment. While these stacks may be termed equipment, the charge is always based on the "probable life of the asset in use," and I presume unless something unusual happens that most of the stack equipment will be in use at the end of 20 years. Therefore in this cost work I depreciate the stack at that rate, 5 per cent, instead of 10 per cent.

Some may not agree with me in capitalizing the work of the bees in combs. But I insist on that. If my bees spend their time this season creating 100 new combs, this season should have the credit. Because they are going to remain right on in use for twenty years more. They will never need building again, and by capitalizing them and then spreading the amount over 20 years as a depreciation charge on stack investment, that makes each year stand its own part of that investment. I may be a little high, but I would hate to undertake making one for 50 cents. I feel that my charge is about right, when compared with the cost of aluminum combs.

My Central Plant Investment

Small honey house, valued at	$100.00
Extractor and small tools	56.40
Total investment	$156.40
I figure depreciation as allowed by the Government.	
5 per cent on building	5.00
10 per cent on other equipment	5.64
Annual depreciation charge	$10.64
This plant has been in use for 4 years, total depreciation for time in use	42.56
Sound value of central plant investment	$113.84
On which I have figured interest at 6 per cent.	

My Stack Investments

8 hives complete	$ 80.75
4 extra bodies, complete	22.05
20 supers, complete	79.90
I have also capitalized the bees and their work in building combs as follows:	
8 colonies of bees at $5	40.00
110 brood combs at 50c each for Dadant and 40c each for Langstroth	52.00
210 extracting combs at 20 and 25c	46.50
Total stack investment	$321.20
While the Government allows 10 per cent depreciation on almost every kind of equipment, hives are in the nature of a building, and probably about as durable, and I have charged the same depreciation as on frame buildings, which gives annual depreciation charge of 5 per cent on stack investment	$ 15.77
Some of this equipment is in use four years, some three and some less. Total depreciation for time in use is	44.52
Leaving net sound value of investment	$276.68
On which I am entitled to interest of	16.82

On the basis of the following figures I figure out my costs as follows:

Debits

270 pounds honey in the hives Nov. 1, 1920, at 10c	$ 27.00
Yard labor, estimated at $3.50	28.00
Insurance and taxes, estimated	4.00
Rent of apiary site, estimated	8.00
4 new queens raised and used in the yard, at $1	4.00
1 new queen purchased and used in yard	1.25
170 five-pound pails used	17.00
Labor and expense extracting and labeling	8.23
20 pounds sugar fed	1.20
Depreciation on central plant	10.64
Depreciation on stack	15.77
Interest on central plant investment, sound value	6.88
Interest on stack investment, sound value	16.82
Total cost of production	$148.79

Against this gross cost I have the following credits:

Credits

5 new queens raised for use or increase, at $1	$ 5.00
8 frames of brood taken for increase	8.00
1 swarm taken for increase	5.00
33 new brood combs built during the season, at 40c and 50c added to investments	14.60
100 new extracting combs built during season, at 20 and 25c added to investments	23.80
8.7 pounds cappings wax at 25c	2.15
310 lbs. of honey left on hives for use of bees	31.00
Total credits for season	$ 89.55
Either taken for investments or chargeable against future operations, leaves	
Net cost of production	$ 59.24

My honey was all extracted and put up in 5-pound pails delivered to the honey house ready to hand out. Production amounted to:

White clover honey produced 564¼ lbs.

Mixed light amber fall honey 290½ lbs.

Total 854¾ lbs.

Average net cost of production, per 100 pounds $6.93

In my small apiary, handled at odd times, it has been necessary to estimate the item of production, labor taxes and insurance. The item of labor I have based on the figures given by H. C. Dadant in the June issue, covering 550 colonies for 1919 and 700 colonies for 1920, the highest average there used being $3.00. So I think I have my estimate high enough. Taxes, insurance and site rent may be a little high, but will do.

For my own personal satisfaction, I have kept cost figures on each individual colony. There is one striking thing I observe. Individual production runs high for the Dadant hives, but lower for the Langstroth. Besides, I cut queen cells an average of 3 times for each Langstroth colony to keep my bees together, but cut no queen cells in the Dadant, and had but one swarm. Results are proportionate.

My colonies are numbered consecutively. D used with a number indicates Dadant hive, L, a Langstroth, and numerals following the letter indicate number of frames.

	Production.	Cost per 100
No. 1D—Worked every minute	228½	$ 4.28
No. 2D—(Swarmed)	78	7.11
No. 3D—(Only strong 6 frame nucleus at opening of clover)	70¾	12.16
No. 5D—Gave 4 frames brood and 3 queens for increase)	196	3.80
No. 6L10—Worked all time	79½	13.29
No. 7D—(8 frames nucleus divided in half May 15)	26	11.80
No. 8L10 — Worked right through	90¼	9.19
No. 10L8 — Worked right through	56¾	10.48

Grouping the 5 Dadant hives together, which included 1 4-frame nucleus and one 6-frame nucleus at the beginning of clover, in one group, and the 3 Langstroth, which were all full colonies, 2 10-frame and 1 8-frame, I got the following results:

Average production per colony—
Dadant 120 lbs.
Langstroth 75½ lbs.

Average cost of production per 100 pounds—
Dadant $5.74
Langstroth 10.94

So much for my costs the first season, running almost exclusively for extracted honey, without attempting much increase.

I feel quite good over the season's outcome. I have no very great expense after my honey is on the shelf, and have sold my clover at an average price of 29c a pound, and the fall honey at 24½c, so I have come out all right on my little bunch of bees.

Michigan.

MULLINS CELL-BUILDING NURSERY AND MATING HIVE

By Jes Dalton

Having experimented and used this hive two years with uniform success, I believe a description will be of interest to American Bee Journal readers. The idea came from Mr. O. L. Mullins, of Uniontown, Pa., formerly President of the Kansas Beekeepers' Association.

To build it, use the old "Long Idea" plan. For convenience use 24 close-spaced or 21 wide-spaced frames. I always use wide spacing in everything. Build it so three 8-frame supers will exactly set on top of it side by side. Leave a good-sized entrance at each end.

Now build in solid excluders at the points that come just under the edges of the center super; I tear up an ordinary wood and wire excluder and use the wires, furnishing a perfect excluder without any extra hindrance to bees and ventilation. This divides the 21-frame compartment into 3 nearly equal 7-frame parts; the central part having no entrance except through the excluder.

Stocking

Stock with two good colonies, headed by young queens of quiet disposition, putting a queen and unsealed brood in each end. Place combs of sealed honey and sealed brood in center part. Put covers on ends, and super on center part, and fill out with frames of emerging brood, even if you have to borrow some from other colonies.

Operating

It is now ready for use. Graft cells (10 to 40) in center of super, using any method you choose (dry grafting can be used to get started). I use the Doolittle system. I use several of these hives and graft, in sone one, every other day, transferring started cells to other building and finishing colonies of this same type. Keep exchanging the brood combs in super that have hatched for combs of emerging brood with the queens down in the ends.

This keeps a fresh supply of nurse bees up around the cells all the time, and confines all operations to the top super, and this saves lifting a super to hunt "wild cells" that they might have built over the unsealed brood in the combs you brought up.

Advantages

I hardly know where to start in enumerating its advantages over any other system I ever tried out. To begin with, it is perfectly balanced, timed or primed all the time. For ideal cell building and nursing you have that double force of nurse bees backed by the heat of the two colonies, and a double field force that brings in honey all the time if there is any.

It is double queen-right, thus giving the best impulse to proper cell building. It is semi-automatic in that it sorts the nurse and field bees, the former remaining up on the emerging brood around the cells and the latter occupying the compartment near the entrance around the queen, if you keep it leak proof.

And as it is natural for bees to carry honey up and to store it in cells from which brood has just emerged, there is a steady flow of honey up around those cells all the time.

As the whole outfit gets more powerful, as the flow advances, you can keep raising the super you are operating on and putting empties under it. They may fill one in a few days and you may have to even super the end compartments over the queens.

You may now have a colony with some hundred pounds of honey, 20 to 30 frames of brood, bees in proportion, and if there is a more ideal place or plan to raise cells I would like to hear of it.

It will store more honey than any other colony in the yard, while turning off cells by the hundred.

As a Mating and Increase Hive

Build and stock exactly as for cell building. Put a tight division board in center of an 8-frame super. Nail screen wire over bottom of it, nailing to division board at bottom. Bore a small entrance hole at opposite ends of super for flight holes or entrance.

Stock this super with 3 good frames of emerging brood and bees on each side, from same colony. Insert ripe cell in either side. Warmth and odor come up from below. In a few days you have two laying queens in supers, all with odor of parent colony. You can take them out with frames of brood and bees, to ship, or requeen, or increase, and restock super from queens below, add fresh cells and go right ahead.

I have taken a queen out of one of those, with 2 frames of brood and adhering bees, and requeened a colony at once, right in the midst of robbing, killing old queen and smoking all bees

down, and placing these two frames with queen between them in center of super, on top of colony, in the middle of the day, with no caging or newspaper either. If you use the two upper queens this way, you now have a field force from 5 laying queens, all left on one stand and all of the same colony, odor, etc.

As an Experimental Hive

It is a fine hive with which to study the nature of bees. Some are lots better cell starters than others, some better nurses and some are not good for either (get rid of these). It is a great drone conserver. You can place a frame of sealed drones in there and when you take the lid off you have a regular swarm of drones. Can lift a super of fresh grafted cells off, take out the combs on one side, over the cells, and watch the nurse bees work, and go and come from those cells.

While I do not expect breeders of the magnitude of Mr. Wing, of California, would take to this plan, I believe it would do the trick for Mr. F. Dundas Todd, of Ontario, who in the September issue of the American Bee Journal, pages 361-2, told of keeping the finest records I had ever seen, but was never able to raise a queen from those heavy producers; especially if he would build it double-walled and pack it.

Louisiana.

AN ANTISEPTIC FOR BEE DISEASES

By Arthur C. Miller

Last spring Mr. F. Dundas Todd, of Victoria, B. C., sent me particulars of the Lewis treatment for European foulbrood and at the same time saying it was equally efficacious in the treatment of American foulbrood. Later I had correspondence with both Mr. W. H. Lewis, the discoverer of its application to bees, and Mr. W. J. Sheppard, Chief Inspector of Apiaries of British Columbia.

So many cures have been offered, many of which I have tested and found wanting, that naturally I was skeptical about this. But it was so well and confidently recommended that I tried it, and tried it carefully, first exactly as recommended, and then varied it until I was sure about every particular.

The article from Mr. Sheppard, in November number, gives all important particulars, so I will not repeat them, but just cite some observations.

"B.-K." was not available here, but I found a chemist who knew all about it and he told me it was a strong solution of sodium hypochlorite and is made as given in Mr. Sheppard's article. It is the home-made solution which I have used. It is so cheap that its cost need not enter into the consideration of the treatment.

After the solution is made, keep it corked, and when using it wear old clothes, because it is a powerful bleaching agent. It is non-poisonous and non-irritating, on the contrary, it is a good sterilizing agent for cuts and abrasions.

In applying it on infected combs a common bush sprayer is used. These may be bought at an agricultural warehouse and cost here 50c. An inspector having much work to do had better have one made of brass or copper, because the tin ones soon rust out.

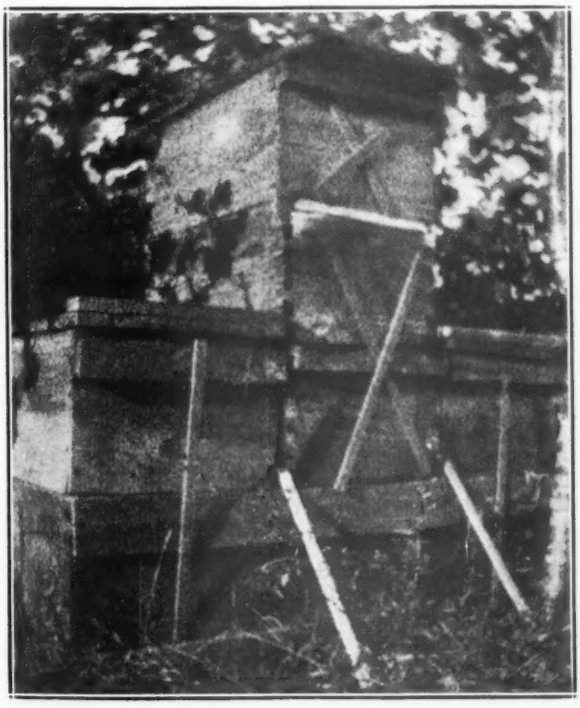
It is wise to catch and cage the queen at the start and release her when through, because she often runs out with the bees and does not always find her way back. The bees are shaken from a comb and the comb is sprayed on both sides and then returned to the hive. Each comb is treated in the same way. The bees keep moving away from the sprayed combs, but soon go back onto them. They lick up all drops of the liquor. When all combs are back in the hive and most of the bees are back in, the queen may be released. I found the full strength solution killed most of the eggs, or at least they disappeared, and this was an advantage, for it was equal to dequeening for three days, and gave the bees a chance to clean up.

We have here a virulent type of European foulbrood and it is hard to combat, but the spray treatment does it thoroughly. In mild cases or when the disease has just appeared, one spraying is sufficient, but if the disease has been running for some time and there are many sealed cells, and particularly if the colony is weak in bees, several subsequent sprayings are necessary. This is because the gas does not penetrate and sterilize the sealed cells and as soon as they are opened by the bees reinfection occurs.

Here is the description of an experiment on a number of treatments and results. Eight colonies were infected, some mildly, some rotten with the virulent type. One treatment sufficed with all the mildly infected colonies, but several, three to four, at intervals of three to six days, were necessary with the others. Two bad cases received several treatments each and almost cleaned up, one having but two or three infected cells on each comb. These colonies were then allowed to remain undisturbed to act as a "control," as the scientists say. The disease began to spread until they were as bad as at first, literally rotten with the disease.

There seems no doubt but that the chlorine gas does destroy all germs it comes in contact with, and for me European foulbrood has lost its terror. I was not able this year to test it on American foulbrood. I have spores of that disease and another year shall infect a colony or colonies and try it out. Dr. Phillips is skeptical as to its efficacy on American foulbrood, because the spores get into the honey, and so are beyond the reach of the spray. The Canadians say it works as well on American foulbrood as on European foulbrood. Let us hope we are as successful, but American foulbrood is not half the trouble the other is.

Rhode Island.



Double colony used for cell building. In addition to 300 queens, over 250 pounds of honey was produced

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French Bee Book

We have ordered from France half a dozen copies of 'Le Mystere des Abeilles," mentioned in the editorials of October, page 395. The price of the book is about $1 in paper covers. We have a couple of orders for them already. Who wants more? First come, first served.

UNEDITED LETTERS OF HUBER

(Continued from November)

Causes of Swarming—Royal Cells—Jealousy of the Queen—Travel Supplies of the Swarms

Lausanne, June 30, 1828.

You are a musician, my dear girl; if I had known that you had bees at Bois d'Ely and swarms to expect, I would have called upon your sensitiveness and upon your ear for music for an observation which I have often made and which might have interested you as it did me; let us hope that it is not too late.

Let us suppose that you have just heard the charivari which indicates everywhere the issue of a swarm; you come running to witness it; there it is above your head. I see you in the midst of many bees, enjoying this fine sight, without being frightened by the tumultuous bustle of so many beings which, we are told, are armed with stings that are so dangerous—but do not believe it.

It has been recognized—and those who know how to care for them will tell you—that bees are never milder than on the days when they swarm. Yet to secure their swarms people treat them in a manner that might irritate them. Those bees, so irascible and vindictive, are never thus in such an occasion and when the proposition is swarming, the redoubtable sting is neither felt nor seen.

Take note, I pray you, of a truly balsamic odor which spreads about you; the odor of honey, which this recalls, often allays their anger. I have caused many fights to end by throwing a few drops of honey upon bees which appeared to be furious. Is honey, for them, when it is scattered in their atmosphere, a talisman which brings them back to their natural gentleness and keeps them from becoming angry?

Do you hear any discord in this numerous concert? This soft humming is, to my sense of hearing, composed only of accurate tones. This aerial music goes straight to my heart; I acknowledge that I never heard it indifferently; is it possible that what I find in it expressive, touching, melancholy and even solemn, comes only from myself or my imagination? I will not deny the natural exaltation which rises within me through this interesting event and this apparent agreement in will and sentiment in beings which are placed (by us it is true) almost at the foot of the scale.

Although I have not said a word to you about it, I am sure that you will divine at least one of the reasons which cause the periodical departure of swarms; that which is true, wise, useful, may be often foreseen. To help you a little, however, permit me to use a comparison which is within reach of the master and of the pupil and convenient for both.

If you had been but a simple shepherdess, would your kindness and your natural reasoning allow you to retain your sheep or your goats within a space of pasture that could feed but half of them? No, doubtless you would not doom them to the horrors of famine. It is to preserve the bees from this danger that nature has instructed them to seek, like nomad tribes, a salvation in periodical migrations.

The queen, which you know only by reputation, is the motive which directs the multitude, whose mother she is. They say that she can produce, in a year, from sixty to eighty thousand brood. This is enough to make up the swarm which is, the following year and perhaps sooner, to seek far away the sustenance necessary to the keeping of the new population.

(Note of the translator.—Huber did not yet know, as we do now, that the queen lays hundreds of thousands of eggs, instead of tens of thousands, neither did he know that which was learned later by the introduction of bees of different colors, that bees live only a short time in summer, an average of about 45 days.)

As the substances which are suitable for the food of bees cannot be increased indefinitely in a limited space, they have been taught to seek far away the food which is required for a constantly growing population; it is for this that wings have been given them, with the knowledge for using them. Let us study now what has been prepared to determine their migration.

Accept my word, dear girl, until you see it with your own eyes. I assure you that I have not accepted anything till I have secured positive proof. The care with which Burnens has informed his master and friend has been a great help in this occasion.

But I must ask of you here again much faith and docility; for will you readily believe that an insect, a simple bee be susceptible to jealousy? You must accept this statement, for nothing is truer; all you require is the evidence. For this purpose a few details are necessary.

You know that a wax-comb is composed of a greater or less number of contiguous cavities which have been named cells; it is in those little lodges that the bees deposit their crops of honey or of pollen and that the queen lays her eggs when they are fit to receive them.

Have you noticed some openings much larger than the cells and with no regularity about them? They are not the result of accident; the bees have left those spaces in the thickness of the combs. Through this arrangement, whenever they are in a hurry to travel over both sides, they can do it much more promptly than if they had to go around the edge of the comb. It is, if you please, like public squares or alleys; in our cities similar spaces have the same utility. Among the bees they have still another; it is there that they build the royal cells of which you have probably heard. In their original shape, those cells resemble an acorn cup, later they will become, as the work progresses, inverted pyramids, at first more or less truncated. It is when the royal cell is only in the shape of a cup and is not deeper than two or three lines (one-fourth to one-sixth inch), that it may receive the eggs that the queen lays in it, perhaps in passing, while she goes from one side of the comb to the other. I am inclined to believe that it is a trick devised by the architect bees. That which confirms this conjecture is that the bees, being unable to build the royal cells horizontally in the comb and give the same direction to the pyramidal part without extending it too far between the parallel combs, in the space reserved for passage, could do nothing better than fasten the royal cell cups vertically, under the edge of the spaces intended for passage; then the pyramidal part could be fastened to the cup and extended vertically in the open space below.

There is another reason which explains fairly well why the royal cells must not be built in the thickness of the comb. The queens, larger and longer than the workers for whom the ordinary cells are intended, would not find in them a space sufficient for their ulterior development.

The queens, in a hurry for laying and finding all the small cells occupied, pass to the other side of the comb through one of these passages, but perceiving the orifice of the outlined cells, insert their abdomen into them after having ascertained that they are not already occupied; they fall thus in the snare which has been prepared for them.

As fast as the small cells are emptied, through the hatching of the worker bees, the queen lays in them, as well as in the different cell cups which she finds open and empty. Her eggs will produce successively royal larvæ and nymphs more or less advanced. It is not only by supplying a broader and differently located lodging that the bees bring to the queenly condition those which were intended only for simple workers. A more exquisite food, perhaps more stimulating and more abundant, brings about the extension of the queen organs in the cradle and especially the development of the sexual organs. Mr. Bonnet, during the visit which he paid me at Pregny, saw in one of my hives, from which I had removed the queen, more than 20 royal cells begun.

A very singular and very important thing which has not been sufficiently noticed and of which I understand but now the usefulness, is the perfect coincidence of the laying of drone eggs, always observed in the season of swarming, with the building of royal cells. A secret link assuredly exists between these two great preparations.

Here we are again reduced to admiration, is it not enough? Without this arrangement the young queens would run the risk of never becoming mothers, or of securing but imperfect mating in case their fecundation should be too long delayed (See next

letter.—Ed.), but, as has been said, everything is in harmony in the natural history of bees.

Follow me another moment and you will see a new point.

For me to have told you that queens were susceptible to jealousy, I must have very evident proofs to give you of so singular a thing.

By what means can they be brought to that and how can a feeling of jealousy and irritation be inspired in them, through the accomplishment of the views that Nature intended?

Let us return to the royal cells; it is there that the thread starts which will lead us out of this labyrinth. Their construction cannot be instantaneous; several days are needed during which many workers are employed successively to build a pyramid out of that which at first was shaped only like an acorn cup.

The queen, after having deposited her egg at the bottom of the cup, continued to lay elsewhere very peaceably without giving the least sign of alarm; it was only when the pyramid was finished that we noticed in her bearing a beginning of restlessness. The royal larva was then filling the cell to its extremity, she was about to pass to the state of nymph, during which she has no longer need of any food. The closing of the cell at that time proves it incontestably.

The agitation of the queen increased as fast as the young larva grew towards its goal; from a very noticeable displeasure the queen passed very quickly to anger, and it is not to be doubted that her rival was the object of it.

When we see her bending her energy upon her destruction and killing her in her cradle when the bees do not put any obstacles in the way of this fury, do you not recognize that the most cruel jealousy has been the only incentive of it? The intention of nature would not be fulfilled if that of the queen was accomplished; if she could kill her rivals in infancy there would be no hopes for swarms, and the colony would perish; the workers taught by kind Nature to oppose this, do it effectively, by surrounding the royal cells with guards numerous enough to prevent the effect of the queen's rage; they always succeed in doing so by opposing her approach without ever using their sting against this mother so cherished; they succeed in drawing or driving her away, by climbing on her back and striking her with their antennæ, which is now known to be a very expressive language.

The bees, the ants, like all the beings which live in association and whose operations require a sort of concert, must understand each other and have some means of communicating to one another their thoughts, their needs, their desires, their fears and above all their dangers. Among insects which we have observed, the repeated and varied touching of the antennæ warn them and instruct them of what they need to know.

Another means of information instructs the bees of that which interests the queen; I have made sure of that in case of her death or her disappearance. To convince oneself of this, it is only necessary to remove the queen from the bees; one will see nothing in the first moments to prove that her loss has been detected, but at the end of a half hour one cannot doubt it. The confusion which reigns in the hive, the abandoning of the brood, the running about of the workers, their precipitate flight at undue hours, their researches around the hive, later the re-establishment of good order and especially the preparations which they make to rear another queen prove that they have perceived the loss, but do not explain how.

It is always the old queen that leads the first swarm; she goes with it after showing by her growing agitation that she gives up to the terror caused by the existence of young rivals in the cradles, but as she does not wait until they have reached the end of their growth and can leave the royal cell, she goes with her swarm without having done any harm to her young rivals; murder takes place only after the departure of the old queen. The one who succeeds immediately finds rivals, at her birth, they are very dangerous for her; their age about equal to hers does not permit her to wait until they also hatch, but she pounces upon the still sealed cells, pierces them and kills with her sting the royal nymphs of which she perceives the existence through some unknown sense.

The appearing of royal cells and the jealousy which they inspire in the reigning queens are therefore truly that which procures the accomplishment of the views of Nature and the means employed by the latter to induce the bees to fly away from their native home and seek their conservation by periodical migrations.

I thought that I had seen and faithfully described everything that has reference to the natural history of swarms; that which has just happened to me proves that one can never be too careful or too modest. I find in a forgotten memorandum of mine the detail of an observation which had taken my attention in the old days and of which I had not retained the recollection; it is dated of the year 1816.

That year which has properly been called the year of famine, did not open in Geneva as likely to be as fatal to bees as it was to all our crops.

The fine blooming of the early spring, the warm and moist temperature which reigned at that epoch caused the honey and pollen to abound in the blossoms. The drones, which appeared early in all our hives, announced early swarms; that expectation was realized; I never saw so many; 10 or 12 hives which I had at the end of winter multiplied by the end of June to the number of 60.

I was then using leaf hives, glassed only at their posterior end. That is where our attention was directed, when we recognized the well-known signs of swarming; that moment is when all the bees, excited by the irritation of their queen, think only of following her, leaving their native home and going elsewhere for a new country. That is what every one knew, or should have known, according to the excellent memoirs of Reaumur.

Let us see what will happen to those fugitives, leaving foolishly their apparently well furnished homes, supplied with everything that they needed, to prefer to it such homes as they would accidentally find and which would undoubtedly be lacking in what would be to their convenience.

What will happen to them if the weather changes at the moment of their entrance into a tree trunk or in the cavity of a rock, especially if the bad weather is prolonged 5 or 6 days? That is not difficult to divine; they will starve infallibly. Their greatest torment will be the discouragement into which they will fall when they will see that their queen, finding no cells in which to lay her eggs, will be compelled to drop them in the air, and consequently that all hope of posterity will vanish. (This discouragement in similar cases has been observed by others).

No, no. it is not at a time when these beings which prove of so great an interest to us have the greatest need of a superior direction that it is refused to them.

When the bees are about to leave their home forever, when everything seems to be in confusion among them, one can see them pounce upon the combs in which the honey has been stored, which are always the farthest away from the entrance. We have seen them entirely strip 3 large combs of honey in a few minutes. Time pressed, it was necessary to follow the queen, and they knew it.

We made this observation on so large a number of swarms in 1816 and since that date, that I have no doubts whatever upon this matter.

(To be continued)

BEESTINGS AS CURE

By A. F. Bonney

When first the writer began in beekeeping, the bee journals were filled with accounts of cures of rheumatism by the use of beesting poison, commonly supposed to be formic acid. He combated this idea, and it was not long before such articles became rare. Recently, however, one appeared in the American Bee Journal, and I wish to advance a few ideas to combat the fallacy, for such the medical men generally consider it, if we except our friends, the Homeopaths.

Rheumatism has always been the despair of physicians, of the Tradition or Regular school, the "Allopaths," so called. For generations the disease was supposed to be due to uric acid in the blood, but that theory was long since abandoned, and we now know that it is caused by the absorption into the circulation of poi-

sonous material, pus, from some part of the body; decayed teeth, tonsils, liver, kidneys, in fact any part of the body may be the cause; any "treatment" which does not remove the cause will fail of permanent results. This has been demonstrated so many times that it is, I believe, unquestioned.

No matter how subject to rheumatism an individual may be, there are times when he is entirely free of pain, and the last remedy he took gets credit for the "cure." However, it is but a question of time before there will be another attack, when other remedies will be used; a "patent" nostrum, a "rheumatic ring" made of iron, and sold at from 50 cents to $5; a horse-chestnut or potato carried in the pocket, hot baths, beestings, or some of the "pathys." That they all fail the prevalence of the disease is proof.

But this article has to deal with the beesting cure, and in this question, as in all others, we must go down to fundamentals. Medical men, of the Traditional school, studying the matter, found that a treatment by a serum to antagonize the mixed infection of the rheumatic poison, gave good results, but was not entirely safe, and the matter of a radical cure of rheumatism is still an open question. It is hoped that further investigation will develop a certain remedy.

Let us now see where the idea of a cure by the use of beestings originated. Along about one hundred years ago a Dr. Hahnemann, of Leipsic, conceived the idea that any drug given a person which would produce certain symptoms in them would cure a disease which gave rise to similar symptoms. "Similia similibus curantur," or "like cures like"; therefore, a drug which would produce a fever would cure a condition of the system which gave rise to fever; and a medicine which produced a certain kind of a swelling would cure a disease causing such a swelling; therefore, as the sting of a bee caused a swelling similar to swelling caused by rheumatism, the sting of a bee would "cure" rheumatism, and should, more logically, cure urticaria, or "hives."

Those were the days before the medical world found that many diseases are caused by germs, a fact which is not now contradicted, except, of course, by uninformed persons.

Not only was Dr. Hahnemann's idea based on a wrong premise, but his remedies were given oftimes in infinitesimal doses. He took an herb and extracted the juice, and this he called "Mother Liquor." It was not standardized, as all drug remedies are today. In other words, a fluid extract or tincture of a drug must contain a certain per cent of the active principle of the drug; morphine in laudanum, aconite in tincture or fluid extract of aconite, and so on. The "Mother Liquor" of Dr. Hahenemann might have contained 5 per cent or 40 of the active principle of the substance used.

Of this "Mother Liquor" the Homeopaths took one drop, put it into 100 drops of alcohol, and mixed it with "one downward shake of the hand." This was absolutely essential. To make the next strength, or "potency" one drop of the first mixture was taken, added to 100 drops of alcohol and mixed with two downward shakes of the hand, and this was continued to as "high" as the thirty-second potency, but no matter whether the third or last potency was used, there was but one drop of the "Mother Liquor in all, which means that in the third there was but one ten-thousandth of one drop of "Mother Liquor" used. This was far too powerful to be used undiluted, so a teaspooful of it was added to a cup of water, and a small dose given at intervals of time.

Years ago the Homeopaths used to secure beesting poison by letting the bees sting a piece of sponge, The poison was then extracted with alcohol—one of the most efficient of germicides. This was diluted to the third or thirty-second potency and given as a "cure." If the third potency was used, a teaspoonful to the glass of water, the patient got approximately one eighty-thousandth of one drop of beesting poison to the dose, assuming that the solution of the poison was about the strength of the drug "Mother liquor."

Later on, some one, fully as brave as the man who first ate an oyster, broke away from the Homeopathic idea and began giving the beesting poison by way of the circulation through the skin, and found a few persons who would endure the pain of the sting hoping for a cure, but the writer has investigated many of these alleged cures, with no satisfactory results. People claimed they were relieved, or were free of the disease, while others confessed that they had rheumatism "just as badly as ever," when reporting later.

Let me ask this question: If the poison of the sting of a bee, or several of them, is a cure for rheumatism, is it not more than likely that the hundreds of thousands of intelligent doctors in the world would have found it out years ago? Nothing can be more certain.

Another thing: A positive proof that the sting of a bee will not effect a cure is that many beekeepers who have written me assert that while they are stung many times daily, five to seven months in the year, they still have rheumatism. Let us drop the term "some form of rheumatism" which the laity loves to use, for there is but one kind of the disease, manifested, of course, in different parts of the body. If the pain be in the lumbar region it becomes Lumbar rheumatism, or Lumbago; if in the region of the great sciatic nerve, it is called Sciatic, in the muscles, Muscular rheumatism, and so on; but the cause is the same, the manifestation, the lodgment of a poison in a certain part.

If the use of beesting poison through the skin would cure rheumatism, the same remedy given internally would produce the same result, and certainly be much less painful.

There is the same objection to vaunting the beesting "cure" as in the use of patent nostrums, it delays the appeal to the educated medical man who has an intelligent hope of finding the cause, and by treating that relieve the patient. I remember one case where a lady, Mrs. M. W., was a severe sufferer from rheumatism; I found that she had a mouthful of badly decayed teeth, and suggested that they were probably the cause of the most of her trouble; she tried, I believe, everything she could think of before having the teeth extracted,. but finally got to it. She began to improve at once, and now, two years after, is relatively free of the disease; but, the tissues were altered by years of irritation, and she suffers slightly at times, and possibly always will.

A number of years ago I sent out a thousand slips stating that honey was a cure for rheumatism, taken in tablespoonful doses, no water to be drunk for two hours after a dose was taken. I received several letters thanking me, as the writers had been cured. One party sent me a dollar. He must surely had been benefited.

I have no doubt whatever that a free use of honey will do as much to cure rheumatism as the sting of the bees will, perhaps more, for the poison of the beesting affects a person but locally. It is not absorbed into the general circulation. If it was it is more than likely that we should soon have many reports of persons killed by the poison, as we now hear frequently of disastrous results following the stinging of some one by bees.

Iowa.

HONEY HARVEST EXPERIMENTS

By John Protheroe

The July number of the Bulletin de la Societe Romande d'Apiculture gives the results of some interesting experiments by the brothers Tricoire:

"1. On the capacity of the honey stomach of the bee, the weight of honey carried, and the time taken to load up.

"We constructed small cubes containing exactly one cubic centimeter of honey. These were closed so as to give access to only one bee at a time. The refilling of these cubes by ourselves and the emptying of them by the bees, several times, allow us to state that it takes forty visits by the bees to empty them completely. The average capacity of the honey stomach of the bee is, therefore, 25 cubic millimeters. The specific gravity of our honey being 1.4, each bee carried 35 milligrammes of honey. The time taken to load up this burden was 180 seconds, that is to say, 3 minutes.

"2. On the number of flowers visited by a bee to collect her burden during a normal honey flow.

"This experiment was made on buckwheat flowers in the month of August. The figures given are the average corrected by several observations. The search, that is to say,

the time taken in going from one flower to another, took 5 seconds. The collection of nectar took 3 only, making a total of 8 seconds per flower. The bee therefore visits with profit 7 flowers a minute, or 420 to the hour.

"The above experiment, often repeated, has shown us that the bee fills her honey stomach in three minutes; divided by 3 seconds, the time spent on each flower for the collection of nectar, we find that it takes 60 buckwheat flowers to make a load. These 60 flowers multiplied by 8 seconds, the total time spent on each flower (searching and exhausting), make 480 seconds; that is to say, 8 minutes.

"For our bees the most distant field is 3,500 meters (a little over 2 miles), the nearest is 200 meters, and the average 1,800 meters. A bee travels at a speed of 1 to 8 meters a second; the average being 4.50 meters, or 270 meters to the minute. The time taken to cover this average distance will, therefore, be between 6 and 7 minutes. For good measure, let us take 5 minutes for going, there being no burden, and 7 for the return with the greater weight. With the 8 minutes for search and loading up, that gives a journey every 20 minutes. As the flow of buckwheat honey only lasts about 3 hours per day, in the morning, every field worker makes scarcely 9 trips a day."

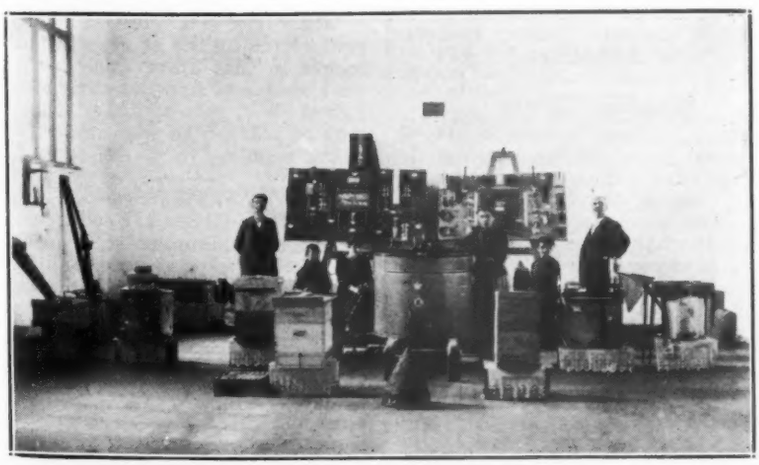
Virginia.

BEEKEEPING IN BULGARIA

In the accompanying photograph is given an exhibit of American beekeeping appliances in Bulgaria. Mr. Nicholas Baracoff, the exhibitor, on the extreme right, was instrumental in making a public exhibit of this material, which attracted the attention of all beekeepers and of the Government authorities who saw it.

His opinion is that a resumption of normal rates of exchange and of normal transportation facilities will mean the introduction of many American methods in Bulgarian bee culture.

There are already many beekeepers keeping bees by modern methods, but they are the exception rather than the rule.



Exhibition of American bee supplies in Bulgaria

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Loss of Queen

About the middle of September, I caught a little swarm of bees. I put the bees into another colony and took the queen and turned her in at the entrance of a hive whose queen was getting old and worthless. I kept watch to see which one the oees would kill, but I did not find either of them, the next day, at the entrance, as expected. I looked into the hive and found the young queen, but could not find the old one, to kill her, and the robbers got so bad that I quit. On the third day I found the young queen dead outside. What was the reason she was killed, after having been accepted?

IOWA.

Answer.—I think I can explain what happened. The old queen was worthless, as you thought, so the bees tolerated the new queen, When you went back to look for the queen, the robbers that were thick made the bees angry and they treated that new queen as a robber. You have probably noticed that all those who succeed in introducing queens urge that one leave the colony alone for a week or more. The purpose of that is to prevent the queen being killed as a stranger, before the bees got entirely used to her All the beekeepers who do much introducing have more or less experience in that matter and all agree that it is the appearance of robbers that causes the bees to kill a queen that has apparently been accepted. She is only tolerated, but would soon be considered as the true mother if such an event did not happen.

Dadant Hives—Average Yields

1. How much does a Jumbo frame of honey weigh?

2. About what would the general average honey yield be for bees in Modified Dadant hives in good location, having good care, counting only strong colonies?

3. Why is the per colony average for the various States so low?

NEW YORK.

Answers.—1. The surface of a Jumbo frame is about equal to 10 sections. If it is well filled and all sealed, it may weigh as much as 10 pounds. But it may run much below that, even when apparently well filled.

2. Our location is only middling good, and we have always figured on an average of 50 pounds of extracted honey, one year with another. But if you count only the strong colonies, it is quite another thing. The question would be: how strong a colony would you accept as a yielder? You might run it into 150 pounds average.

3. Perhaps the explanation is that so many colonies of bees do not get any care and that many locations are unfavorable to honey production.

Honey Vinegar

Is there such a thing as honey vinegar? How is it made, and is it any better than any other vinegar?

MISSOURI.

Answer.—Honey vinegar is made by mixing 1½ to 2 pounds of honey with a gallon of water, adding fruit juice enough to start fermentation. After the alcoholic fermentation is well started, the acetic or vinegar fermentation will start if the liquid is sufficiently exposed to the air. Its quality is that of the best vinegars, although it is not as good, perhaps, as vinegar made from high-grade wines. But it is certainly above the average cider vinegar.

Do Bees Dance?

My bees seem to be doing the "shimmy" on the alighting board in front of the hive. They move back and forth about one-half inch with heads down as if trying to polish the board. Is this anything serious?

FLORIDA.

Answer.—No, it is not serious, for we have seen healthy colonies do that often. It really seems to me as if the bees were polishing the front board. Perhaps they are. Whoever finds a good explanation for this action will confer a favor on us by giving it so that it may be published in the American Bee Journal.

Loss Through Manipulation

Upon opening a hive with the use of smoke, the bees at once fill themselves with honey. I would like to know what disposition is made of the honey so eaten; that is to say, do the bees afterwards re-deposit this honey in the cells, or is it consumed by them? I wish to know if there is a loss of honey each time the hive is opened, or whether it is merely temporarily withdrawn and afterwards re-deposited.

VIRGINIA.

Answer.—I don't know, and it would be somewhat difficult to find out, positively. However, I will submit some surmise:

The average European beekeeper seems to think that whenever you disturb a hive of bees, if it is ever so little, you confuse the bees and they lose both time and honey. Personally, I have never thought that the opening ot a hive with smoke did much harm, if any at all. I have seen bees fly out to the field through the open top of a hive, while manipulating it.

There is, however, a question of how greatly your bees are disturbed. If you smoke them thoroughly and compel every bee to fill with honey, just as they do when they prepare to swarm, there will evidently be a lull in the work; they may hang in clusters for hours and consume considerable honey, both through the digesting stomach and through the wax-producing organs. But what need is there of so much smoking? It is merely necessary to frighten such bees as seem disposed to show anger, and make those bees fill their honey sac.

Undoubtedly the honey is re-deposited in the cells, when the excitement is over. But how much of it, if any, is consumed, is still an open

question. It will be for some new Huber to investigate this matter. Huber's narrations of how the bees fill with honey when ready to swarm is exceedingly interesting.

Heating Extracted Honey

In the October issue of American Bee Journal I note the Texas "Rules for packing bulk comb honey," page 410. "Extracted honey must have been heated to not less than 120 degrees," etc. I keep some 5 or 6 colonies for my own pleasure and this year will have some 300 pounds to sell. I usually put it in Mason jars. Will you kindly tell me whether it is absolutely necessary to heat it, as I never have done it? It sometimes becomes granulated in the jars. Will the heating keep it liquid? Is there any way to prevent granulation?

NEW YORK.

Answer.—Yes, heating will prevent granulation, and we think that this is the only reason why they require it. But it is not absolutely necessary that you should heat your honey. I think it is much better to tell the people to whom you sell honey that it will granulate, and to explain to them that it is just as good in that shape. I have always thought that honey that has been heated loses some of the essential oils that come from the blossoms. Of course, if it becomee the custom all around to heat it, we will have to follow suit. Be sure not to overheat it.

Bees Gnaw Cloth

I have some colonies of bees that last winter gnawed the cloth (cotton) that I laid over the brood frames. I would find great quantities of lint scattered over the bottom board and the cloth ruined.

How would it work to lay a piece of screen wire cloth over the frames and *then* put on the top packing? MISSOURI.

Answer.—Bees do pull cloth to pieces, by taking hold of the little threads that project, and pulling till they make a hole. The softer the cloth the more easily they will make holes in it. If you use khaki or coarse gunny they will be slow about making holes in it and will not have any lint scattered about the bottom board. For winter we remove the cloth altogether. Wire cloth might do as you suggest. At any rate, it is worth trying. We use straw mats over the combs, with absorbents above them. But old carpets or gunny sacks would do just as well. If you use wire screen let us know how you succeed with it.

ODDS AND ENDS

Special Course in Beekeeping

The Iowa College of Agriculture is offering a special course of twelve weeks for beekeepers which looks very attractive. Many are so situated that they cannot take a long course but will be greatly benefited by the opportunity here afforded. The course opens at Ames on January 2, 1922, and continues until March 22. With the beekeeping work is combined instruction in poultry and horticulture. The student is allowed considerable latitude and can devote most of his time to the particular thing which is most attractive to him. The course is divided into two six-weeks terms, so that those who cannot stay for the full twelve weeks can take six weeks and finish the course at another time.

Any one interested in this special course will do well to write Prof. F. B. Paddock, Ames, Iowa, for the booklet giving full information concerning expenses, etc.

In addition to this course there will be a short course of four days during Farm and Home Week the last week in January.

Southern California Fair

San Bernardino County Beekeepers' Club captured first prize for feature display, at the Southern California Fair at Riverside, in competition, with Riverside and Orange counties, which received second and third places, respectively.

The exhibit was most attractive and included all kinds of honey, beeswax, bees, canned goods put up with honey, and other products of an apiary. The first money amounted to $100, in addition to the feature.

Bee Jelly

The November Journal just received. On page 458 you quote a statement of a little boy calling honey "bee jelly." I laughed when I read the article. I have a little nephew "Thomas J. Hoyes," of Rensselaer, Indiana; when he was 21 months old, at our dinner table, in asking for the honey he said: "I some jelly, make a bee out there," and as he made this request he pointed first to the honey and then turned to the window and pointed to the bee hives.

My wife and I have enjoyed repeating this little fellow's statement to almost everybody who comes to our home. Frank Foltz.

Indiana.

Father of Large Family

A few days ago, at Warsaw, Ill., occurred the death of an old beekeeper, Mr. J. B. Gehin. He was born near the French line of Alsace-Lorraine, emigrated to the United States about 1878, and became an American citizen. He was the father of 10 children, 42 grandchildren and 15 great grandchildren. No race suicide there.

Illinois Convention

G. M. Withrow, Secretary of the Illinois Association, writes to advise that the Illinois convention will be held at the St. Nicholas Hotel at Springfield on December 14 and 15, instead of the dates announced in our November number. Illinois beekeepers will note the change.

Mississippi Awake

Perhaps nowhere is more active effort being put forth to advance the interests of the honey-producing industry than in the State of Mississippi. The latest from her borders is the report of the meeting of the September field council of all the extension workers of the College. At this meeting the interests of beekeeping was the subject up for special consideration. The needs and opportunities of bee culture in Mississippi were placed before this group of field workers in such a way as to enable them to appreciate the value of the beekeepers' contribution to the welfare of the State.

Iowa Convention

Secretary Paddock announces that the Iowa convention will be held at Waterloo on December 15 and 16.

Sippel to Montana

O. A. Sippel, formerly of Guelph, Ontario, is the new man in charge of the beekeeping work at the Montana College of Agriculture. Montana has recently provided for bee inspection and now that the subject will be given serious attention at the College of Agriculture, we look for real development in beekeeping within her borders.

Rea to Pennsylvania

Announcement has recently been made of the resignation of George H. Rea as beekeeping specialist at Ithaca, N. Y., to accept a position as Professor of Extension in Apiculture at State College, Pennsylvania. He was one of the first extension men in the field, giving attention to beekeeping, and his work has been very successful. We feel that the beekeepers of Pennsylvania are to be congratulated upon Mr. Rea's return to his native State. No announcement has been made as to the selection of a successor for Mr. Rea in New York.

Bee Clubs Popular

The boys' and girls' clubs are increasing in membership and interest in all sections of the country. There are numerous reports to the effect that the bee clubs are doing much to raise the standard of beekeeping in many localities where the old-time box apiaries are the rule.

Another Crazy Reporter's Story

The statement has been widely published that B. M. Hatfield, an oil operator, has a hive of bees in the gear box of his automobile. "They travel with me over the country," he says, "When I stop they all pile out and gather honey. When I honk my horn they all come back home again."

The public is being fed constantly with such impossible tales about bees and honey until the general view of beekeeping is very much distorted.

The Latest Booze Story

According to a Virginia paper, officers searching the premises of a bootlegger in that State were for a long time unable to find the place where he stored his supply of liquor. Eight gallons of moonshine was finally located in the beehives in the front yard.

A Florida Proposal

The Florida State Beekeepers' Association is planning to sponsor and guarantee the production and sale by its members, of early in the season, dependable, high-grade queen bees and package bees.

It is hoped to furnish a considerable quantity of the package bees the coming spring (1922); and queen bees just as soon as tests and experiments now under way have developed a product worthy the attention of discriminating buyers.

Why Prices are Low

Only the beekeepers themselves are to blame for the low honey prices. The first part of August I got a letter from one of the large firms in Chicago. They asked for a shipment of honey and said they were paying 10c for white clover. I answered them that I had no honey to offer at that price. Two weeks ago I got a letter again from the same firm, saying they could use some honey at my price. You can't blame the jobbers for paying a low price if the beekeepers are satisfied, but I don't think they got much honey at the price they offer in the bee papers.

F. W. Luebeck, Rt. 2, Knox, Ind.

Cornflower for Honey

A small plot of batchelor's button or cornflower was sown by the boy under a window. The flowers began early in the summer. I noticed the bees on them before the buds had opened. From that time on the bees visited the flowers from early morning till late at night. Even after the flowers had dried up the bees would come and work over the dried pods. They must be great producers of nectar. H. O. Hutton, Washington.

Beekeepers' Meeting at Gainesville, Fla.

The Florida State Beekeepers' Association held its second annual meeting at Gainesville, Fla., on October 6 and 7. During the two days of the meeting a splendid program gave those attending an opportunity of learning just what has been and could be done with beekeeping in Florida. Mr. E. R. Root, Wilmon Newell and Dr. H. R. Trusler were among the principal speakers. The most interest was shown in the proposed "Queen and Package Bee" business, which the Association will sponsor. Plans for advertising Florida honey during "Florida Honey Week" (third week in November) were also formulated. One feature of the meeting was a guessing contest of the different Florida honeys, prizes being high-bred queens.

Frank Stirling.

Comments From Dalton

I wish to approve every word in L. B. Smith's article, page 407. It is a pity he did not write a whole page. I pack exactly as he does and my experience is exactly his in every way. It is the first article on wintering printed in a Northern journal that fitted the Southern condition.

I was amused at the bees in the sorghum mills, page 408. In Louisiana we have pure sugar cane mills making sugar syrup, a little mill about every mile.

When I first came to Louisiana J. F. Archdekin was having it hot and heavy with several of these little mills. They grind in balmy, sunny days in late fall here when there is not a bit of honey in the fields. Archdekin moved four miles down river and I occupied his territory, but the syrup makers still cussed Archdekin, and I marvelled that his bees, after they got in the habit of stealing syrup came back to these mills for years. He finally moved to Missouri, but "his bees" still come back and steal syrup and annoy the syrup makers greatly. Get the point? Lay it all onto the beekeeper that has moved away. Jes Dalton.

Safe Introduction

On page 367, October, a reader wishes to know how to introduce queens to cross hybrid bees. I have done so safely many times the past summer without the loss of a single queen.

Just kill the queen in the hybrid colony and make sure there are no queen cells. Over the hive body place a sheet of newspaper with a hole punched through but with edges of paper still coming together. Place the queen on a frame of emerging brood and put this nucleus in a hive-body and set over the colony where the queen has just been killed. Put on the cover and leave alone for two or three days. The frame of brood with queen may then be put down and the upper story removed. I believe this is the best way I have ever tried.

Irving B. Long, Missouri.

Poor Year in British Columbia

Referring to this season's crop, I am sorry to say that it has been worse than nothing. While much of the world was sweltering under abnormal heat and praying for rain, Northern and central British Columbia had cool weather and a most exceptional rainfall. One correspondent says that July was wet, August was wetter and September wettest. The oldest inhabitant can recall nothing like it. Hay growth was luxuriant, but it is all in the fields. Bees could not fly, so we are feeding up for winter. I may add that southern British Columbia has had a short, cool summer, with a mighty poor crop. Vancouver Island is worse than a blank and much of the lower Fraser district is the same.

F. Dundas Todd, Victoria, B. C.

A Peculiar Accident

Phil Nichols, an Indiana beekeeper, was recently reported as having been painfully burned when his cotton bee veil caught fire from his smoker when he was taking off honey. There was a sudden flash, when the veil caught fire and his head was instantly enveloped in flame.

Introducing With Cell Protector

To introduce a new queen, I first kill the old queen and place the new one in a West spiral cage with feed cup in place. This cage is then placed in the center of the hive between two brood combs for 24 hours. The food cup is then removed and a plug of wax made from cappings or soft comb and a little honey used to close the opening of the cage. The plug is put in just before dark in the evening and must not be too large or hard. The bees will remove the plug and release the queen.

Should there be a virgin or a cell left in the hive the bees will not feed the queen in the cage, leaving her to starve. This is the best way I have yet tried for introducing either virgins or mated queens.

British Columbia.

Hans Johanson.

Another Method of Introduction

A daughter of the best queen purchased this year was in a queen-mating nucleus. Wishing to break it up, and fearing somewhat to introduce by the regular method so late in the year, for a miss might ruin the colony, I put the young queen in a provisioned Miller cage. This was placed on the top bars of the third story and left there for five days. Then, just at night, I ran her into the entrance of the hive with a puff of smoke to help her along. Four days later I found the carcass of the old queen in front of the hive. I clipped the young queen in a special manner in order to know which had met its fate.

The plan looks like a good one to use at the close of the season, with the odds all in favor of the young queen, if the bees do not ball her.

New York.

E. M. Barteau.

Notes From California

Southern California beekeepers are up in arms, so to speak, regarding the State Association being taken to the north part of the State. It was decided to call a mass meeting of all the good and true beemen of South California, the first week in November, to try and work out some plan whereby the many hundreds of beemen may become more closely united in a common cause and interest.

What we might term the rainy season in California has just commenced (October 3), with a generous rain storm, precipitating from one-half inch to 2½ inches of rain throughout the Southland, and forest and brush fires have been raging through different sections, and the loss of colonies, within the fire zone, has been very heavy, we fear. The rain of the past few days has helped to quench the fires, and danger is about past for any general fires this season.

Prospects bid fair for the starting of another bee magazine in Los Angeles, serving the coast in general. Plans are under way at this time.

The honey market is practically devoid of any action; the tone is a little stronger than 30 days ago, but nothing to boast of; few car loads of honey moving east; some local shipments, in case and ton lots, to the middle west; quotations above and below 10c; market dull; crop is estimated by us, based on all information available, to be 31 per cent.

G. W. Bercaw.

New Jersey Convention

The New Jersey Beekeepers' Association will hold its Annual Convention in Trenton, N. J., on January 12-13, 1922. Mr. Crane, of Vermont, and Messrs, Stewart and Bedell, of New York, will be on the program, as well as other interesting speakers.

Elmer G. Carr, Secretary-Treasurer.

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Bee Meeting at Burlington

The beekeepers of Des Moines County, Iowa, will meet at Burlington, Iowa, on January 10. G. H. Cale will be the principal speaker.

Indiana Convention

The Indiana Convention will be held on December 15 and 16, this year, the same dates as Iowa.

Ontario County

The Ontario County, New York, beekeepers will meet at Canandaigua on December 2 this year.

British Columbia Beekeeping

A recent report on British Columbia beekeeping gives the total number of colonies for the Province as 10,329, from which was produced 309,074 pounds of honey in 1921, or an average of 30 pounds per colony. The Lower Fraser Territory leads, with a production of 116,614 pounds.

The wholesale price of white extracted honey is estimated at 29 cents per pound, and the retail at 35 cents.

National League Emblems

These can be used either at local, state or national meetings. They were made by direction of the American Honey Producers' League and can be supplied either in gold or bronze, pins or buttons; warranted to last as long as the wearer; not too large, and very pretty. Each 50 cents, dozen $3.60. Send order to American Bee Journal. Hundreds of them are in use through the country.

League Notes

On January 30 and 31, 1922, the second annual meeting of the League will be held in Salt Lake City, Utah. Every State and local association belonging to the League should send a delegate to the meeting. All associations, whether members or not, are urged to send representatives, as much of importance will occur. The future of the beekeeping industry lies in the action of this assembly. The Secretary wishes that every one who will attend will notify him as soon as possible, so plans can be made for the program.

The League advertising campaign is a success. The requests for the honey recipe booklets are pouring into the Secretary's office at San Antonio. The extent of this publicity can be expressed geographically. Requests have been received from as far north as Treadwell, Alaska and St. Johns, New Foundland, south to the Canal Zone, west to the Philippine Islands and east to the Bermudas. Every State of the Union and Canada are represented many times. Cuba, Porto Rica and the Hawaiian Islands come in for their share. Honey dealers and grocers have ordered these booklets in large quantities. If you want a copy sent to your friends, send in the names to the Secretary, Box 838, San Antonio, Texas.

The best thing about the campaign is that the trades papers are making mention of it and giving much favorable comment. The Market Reporter states that the campaign is in a large way responsible for the increasing demand for honey. The Bakers' Review, The Wholesale Grocery Review, and even System have nice accounts of the League. Printers' Ink and Class will print articles on this activity of the League.

Do you realize what the League means to you? It is costing the most of you one dollar apiece and you are not taking advantage of half of the benefits of the League. We have one individual membership, taken in order to get the protection of the League warning notices. Have you ordered yours yet? They cost the membership but 10 cents each.

The time is at hand for the State Association meetings. The League has accomplished wonders with the small amount of aid the various Associations were able to give. Every beekeeper should urge that his Association retain its membership and see that a delegate be sent to the Salt Lake City meeting. The advertising campaign is in no small way responsible for the recovery of the honey market. This has put dollars into your pockets. It has defended beekeepers in court. It has done a thousand and one services for beekeepers. It has made good. You as a beekeeper cannot **afford** to be without its services. Give the League your support for 1922 and watch the demand for honey reach a place where you will have to hustle if you provide your part.

H. B. Parks, Sec'y.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less that 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

ATWATER HONEY—Supply your customers.

FOR SALE—Spring delivery, 1922, 2 lbs. bees and young three-banded Italian queen, $5. Special price on 2-lb. queenless packages. Health certificate with each shipment. Satisfaction guaranteed.
J. L. Leath, Corinth, Miss.

LARGE, HARDY, PROLIFIC QUEENS—Three-band Italians and goldens, pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. After June 1, untested queens $1.50 each, 6 for $8, 12 or more $1.40 each, 25 or more $1.25 each. Tested queens $3 each, 6 for $16.
Buckeye Bee Co., Zoarville, Ohio.

BURLESON ITALIAN BEES and QUEENS in 2 and 3-lb. packages; 1 2-lb. package with select untested queen, $5; 25 or more, $4.50; 1-3 lb. package with select untested Italian queen, $6.25; 25 or more, $5.75. Ten per cent with order, balance 10 days before shipment; 1,000 colonies to draw from. Can deliver the goods on time. Safe arrival and satisfaction guaranteed..
T. W. Burleson, Waxahachie, Texas.

"SHE SUITS ME."—Watch for my advertisement in the January, 1922, issue.
Allen Latham, Norwichtown, Conn.

BLUE RIBBON QUEENS—Carniolans and Italians. Order now for early spring delivery. Geo. W. Coltrin & Son, Mathis, Tex.

WHEN they say they have better, we know different. We defy the world to beat our new method. We are not boasting of selling thousands. We expect to furnish you all you want, if that is 30,000. Untested, $1; tested, $2. F M. Russell, Roxbury, Ohio.

FOR SALE—At pre-war prices, very best Italian queens and bees. Give us a trial; 700 colonies to fill your orders with.
Rosedale Apiaries, Big Bend, La.
J. B. Marshall, H. P. LeBlanc, Props.

GOLDEN QUEENS, GOLDEN—1922 price: untested, one, $1.25; doz., $12. Select untested, one, $1.50; doz., $15; tested, one, $2.50, doz., $27.50. Pure mating and safe arrival guaranteed in United States and Canada. Booking orders now.
Tillery Bros., Georgiana, Ala.

FOR SALE—Three-banded Italian queens. Write for prices. W. T. Perdue & Sons,
Rt. 1, Fort Deposit, Ala.

FOR SALE—My 1922 bees and queens, the big yellow kind; none better. They must satisfy or money will be refunded. Write for my special prices.
E. F. Day, Honoraville, Ala.

AM NOW BOOKING ORDERS for 2-pound packages of 3-banded Italian bees with untested queens, $5.50 each package; 25 or more, $5.25 each. Terms one-fourth down. No disease, and perfect satisfaction guaranteed..
J. J. Scott, Crowville, La.

FOR SALE—Early package bees, nuclei and queens. Shipping season from March 1 to June 1. We handle 1,800 colonies. No disease. Loveitt Honey Co.,
602 N. 9th Ave., Phoenix, Ariz.

IT WILL PAY YOU to write for my 1922 circular and price list before placing order for those bees. R. V. Stearns, Brady, Texas.

BOOKING ORDERS for spring delivery. Queens, package bees and nuclei. The reliable A. I. Root strain. Golden and leather-color Italians. Virgins, 60c; untested, $1.50; select untested, $2; tested, $2.50; select tested, $3. Circular free. A. J. Pinard,
440 N. 6th St., San Jose, Calif.

THREE-BAND QUEENS, packages and nuclei, any size. Special orders solicited. Absolutely free from disease. Delivery as early as March 25. Special discount on May delivery if booked this month. Proposition to Farm Bureaus and County Agents. Write for prices and terms.
Tupelo Honey Co., Columbia, Ala.

FOR SALE—One-frame, two-frame, and three-frame nuclei, with queens, both untested and tested. Our nuclei are fine. Write for prices.
H. B. Murray, Liberty, N. C.

BEES by the pound for spring delivery in 1, 2 or 3-pound packages; also superior Italian and Carniolan queens from selected domestic and imported stock. Early order discount on orders booked now. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

FOR SALE—Our famous Italian bees in packages, 2 and 3-lb. packages with queens for sale; they are as good for honey-gathering as any bees in the U. S. A.; they are as yellow and as gentle. Our bees have stood the test all through the U. S. A. and Canada; recommended far and wide. We are free from all brood disease. Our famous Root-Howe-Davis bees that have been bred and selected from a large number of yards, will please you. Try them. We give prices on request. Some of our Wisconsin customers have written that the packages received from us in May, 1921, gave 150 pounds of honey this year. Reference, Bank of Liberty, Liberty, N. C.
H. B. Murray, Liberty, N. C.

NUCLEI and Cypress hives for 1922 delivery—Three-frame black or hybrid bees, Italian queen, $5.00; 3-frame Italian bees and queen, $5.50; 3-frame black bees and queen, $4.00; 3 pounds black bees and Italian queen on comb of honey, $5.50. Cypress hives complete; 5 10-frame, $12. Full depth supers complete, five 10-frame, $7. Prices on other sizes upon request. I own the timber and manufacture the hives, with no middlemen involved. Book orders now, so you can name shipping date to suit yourself. One-third with order to guarantee acceptance. Reference: Toombs County Bank, Lyons, Ga. Good farm for sale cheap.; 660 acres. Terms to suit purchaser. Otto Diestel, Elza, Ga.

BEES in 2-pound packages, our specialty for 1922. Now booking orders See ad elsewhere for prices. Caney Valley Apiaries
J. D. Yancey, Mgr., Bay City, Texas.

QUEENS OF QUALITY for 1922—3-banded Italians only. After April 15, untested, $1.25; tested, $2. Satisfaction guaranteed.
P. M. Williams, Ft. Deposit, Ala.

WE are now booking orders for spring delivery of our queens and package bees. Write us for prices. Graydon Bros.,
Rt. 4, Greenville, Ala.

1922 PACKAGE BEES and QUEENS—Untested and day-old, in Thompson safety introducing cages. Discounts on early advance orders. James McKee, Riverside, Cal.

QUEENS, package bees and nuclei. Begin shipping March 15, 1922. Circulars free. Booking orders now.
Dr. White Bee Co., Sandia, Texas.

FOR SPRING DELIVERY, 1922—One vigorous Italian queen, one frame emerging brood, one pound bees. Price, complete, f. o. b. Bordelonville, $5. Additional frames of brood, each $1; additional pounds of bees, each $1. Queen introduced and laying enroute to you. Safe delivery and satisfaction guaranteed. No disease. Reference given. Orders booked one-fifth down, May delivery. Send for addresses of satisfied customers.
Jes Dalton, Bordelonville, La.

BEES—100 colonies for sale.
E. F. Atwater, Meridian, Idaho.

FOR SALE—400 stands clean bees, extracting equipment; good location; for reason write. The Oregon Apiary Co.,
Nyssa, Oregon.

HARDY ITALIAN QUEENS, $1 each.
W. G. Lauver, Middletown, Pa.

BEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigreed breeding stock.
Elton Warner, Asheville, N. C.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

FOR SALE—Leather colored Italian queens, tested, until June 1, $2.50; after, $2. Untested, $1.25; 12, $13. Root's goods at Root's prices. A. W. Yates,
15 Chapman St., Hartford, Conn.

BOOK YOUR ORDERS for QUEENS now—Goldens, $2; tested, $3; banded, $1.50; tested $2.50; six or more, 10 per cent less.
Clover Leaf Apiaries, Wahoo, Neb.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere.
Nueces County Apiaries, Calallen, Texas,
E. B. Ault, Prop.

WE are now equipped to handle your early spring orders for package bees and queens, especially bred for the production of honey. Our queens are bred from the best stock obtainable, and will give satisfaction. Safe arrival guaranteed. Write for prices and terms.
Sarasota Bee Co., Sarasota, Fla.

SWEET CLOVER SEED

FOR SALE—Hubam clover seed; genuine Hughes strain (scarified).
Jas. H. Kitchen, Rt. 5, Springfield, Ohio.

FOR SALE—A limited quantity of my crop of giant annual white sweet clover seed of the Hughes variety. This seed was all produced under cultivation. References and prices furnished upon application. All seed genuine, certified and scarified. Get your supply before I am all sold out. Edw. A. Winkler, Rt. 1, Joliet, Ill.

HUBAM CLOVER GUARANTEED — Start growing this plant immediately if you wish to make a success with bees. The wise beekeeper who gets a generous start of Hubam for 1922 is assured a good honey crop for next year and every year following. Hubam will make a good honey crop in dry climates where most plants fail.
If you haven't land of your own, plant all waste land in your locality.
The Hubam seed crop promises to be the best farm crop for 1922. In other words, there will be big money in the seed crop alone.
The price of seed is now $2 a pound.
Fred M. Schader, Sunnyside, Wash.

HONEY AND BEESWAX

ATWATER HONEY—Supply your customers.

FOR SALE—White clover and goldenrod honey, put up in 10-lb. pails. Well ripened; mild flavor. Write for prices.
John Tyrell, Snover, Mich.

FINE LIGHT HONEY—Mountain mint and milkweed in new 60-lb. cans and cases, 13c lb.; also buckwheat-goldenrod honey in 60-lb. cans, 9c lb.; all f. o. b. here.
A. G. Hann, Glen Gardner, N. J.

EXTRA FINE white sweet clover honey. Case of two 5-gallon cans, 120 pounds, $17; one can, $9; five cases, $82. Sample 10c.
C. S. Engle, 1327 E. 23rd St., Sioux City, Ia.

FOR SALE—Finest alsike, alfalfa, sweet clover honey in 60-lb. cans.
R. Selwyn Wilson Buhl, Idaho.

FOR SALE—Buckwheat honey in 60-lb. cans, one can to case, liquefied $6; 2 cans to case, granulated, $10.80.
John J. Lewis, Lyons, N. Y.

FOR SALE—Extra fancy clover honey, well ripened and put up in new cans,60 lbs. net, per case of two cans, $15 50.
Edw. A. Winkler, Rt. 1, Joliet, Ill.

FOR SALE—Highest grade honey in 60-lb. cans, 2 in case, at 12c per lb.; amber honey at 10c per lb. Julius Gentz, Wabeno, Wis.

HONEY FOR SALE—In 60-lb. tins, water white orange, 14c; water white clover or white sage, 13c; extra light amber sage, 11c; New York State buckwheat, 10c, for immediate shipment from New York.
Hoffman & Hauck, Inc., Woodhaven, N. Y.

CLA-FO-NY quality buckwheat honey (liquid or crystallized), 5-lb. pails, 65c each, 15 to case. Clarence Foote, Delanson, N. Y.

FOR SALE—Amber honey in 5-lb. pails, 12 to case, $8.50 here. Sample pail $1. Money back if not satisfied.
Luehrsen, 8243 Avalon Ave., Chicago, Ill.

FOR SALE — White and amber extracted honey; also comb honey. Write for prices. State quantity wanted.
Dadant & Sons, Hamilton, Illinois.

HONEY—SUPPLY YOUR CUSTOMERS—Finest alfalfa-clover honey, extra strong cases, case of two 5-gal. cans, $12; case of six 10-lb. pails, $7.20; case of twelve 5-lb. pails, $7.80, all f. o. b. here.
E. F. Atwater, Meridian, Idaho.

FOR SALE—No. 1 white comb, $6 per case; No. 2 white comb, $5 per case of 24 sections; six cases to carrier. Clover extracted, in two 60-lb. cans to case, 15c per pound; 5-lb. pails, $1 each, 12 to case. Amber baking honey, two sixty-lb. cans to case, 10c per pound; same honey in 50-gallon barrels, 8c.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—Extra choice extracted white clover honey, put up in 60-lb. cans and 5-lb. lithographed pails. Sample 20c, same to apply on first order.
E. J. Stahlman, Grover Hill, Ohio.

FOR SALE—Finest Michigan raspberry, basswood and clover No. 2 white comb, $5.50 per case; No. 1, $6; fancy, $6.50; extra fancy, $7, 24 Danz. sections to case. Extracted, 60-lb. cans 15c per lb. W. A. Latshaw, Clarion, Mich.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

HONEY WANTED—Give particulars in first letter. Elton Warner, Asheville. N. C.

SUPPLIES

ATWATER HONEY—Supply your customers.

FOR SALE—Standard 10-frame hives with reversible bottoms, metal covers and inner covers; without frames, $3 each. Bodies $1.25 each. Give me a trial order.
Thomas Cordner, Sparta, Wis.

FOR SALE—Western beehives, standard sizes, manufactured from red cedar and white pine; odd sizes made to order. Williams Bros.,
5125 82nd St., S. E. Portland, Ore.

BEEKEEPERS — Reversible cypress bottom-boards, perfectly milled, 5 or more, 70c each.
J. B. Sanderson, Manufacturer of Beeware,
Fredericksburg, Ohio.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.
The Colorado Honey Producers' Association,
Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.
American Bee Journal, Hamilton, Ill.

MISCELLANEOUS GOODS

We list below numerous goods, very slightly shopworn, or odd stock, at prices which will save you money:

13 wiring boards for Langstroth brood frames, Hoffman size, ... $1.00 each
1 transformer for 60-cycle 110-volt current, $2.50
9 10-frame Tri-State honey boards.... 25c each
145 fiber mats for 10-frame hives .....30c each
2 8-frame moving screens for entrances of hives ..... 25c each
5 10-frame moving screens for entrance hives 25c each

HIVES AND PARTS

4 crates of 5 1-story 8-frame tri-state hives with frames ..... $14.28 per crate
1 crate of 5 1-story 10-frame tri-state hives, with frames ..... $15.70 per crate
5 crates of 5 No. 1 8-frame tri-state supers, $4.15 per crate
10 crates of 5 No. 1 10-frame tri-state supers $4.55 per crate
3 crates of 5 8-frame tri-state supers, with 5⅛ frames ..... $4.10 per crate
5 crates of 5 10-frame tri-state supers, with 5⅛ frames ..... $4.55 per crate
3 crates of 5 No. 2 10-frame dovetailed supers $5.65 per crate
3 crates of 5 10-frame dovetailed supers, with frames ..... $5.65 per crate
23 crates of 5 8-frame 1-story dovetailed hives with frames ..... $11.90 per crate
1 crate of 5 10-frame dovetailed supers, 16¼ wide, for 4¼x4¾x1½ sections, $4.60 per crate
1 crate of 5 No. 3 10-frame dovetailed supers $5.65 per crate

BOTTOMS AND COVERS

1 crate of 5 10-frame dovetailed bottoms, $3.30 per crate
29 crates of 5 8-frame Excelsior covers $3.12 per crate
17 crates of 5 8-frame ventilated gable covers, $3.20 per crate
1 crate of 5 8-frame dovetailed flat wood covers with inners ..... $3.20 per crate
8 crates of 5 8-frame Colo. covers, with inners ..... $6.00 per crate
11 crates of 5 10-frame Colo. covers, with inners ..... $7.00 per crate
5 crates of 5 10-frame double wood covers with inners ..... $3.30 per crate
6 crates of 5 10-frame ventilated gable covers $3.30 per crate

SECTIONS

30 crates of 500 4¼x1¾ 2 side sections, $5.50 per crate
8 crates of 500 4¼x1 15-16 2 side sections $5.50 per crate
6 crates of 500 4¼x2 2 side sections $5.50 per crate
7 crates of 500 4x5x1⅝ plain sections $5.00 per crate
3 crates of 500 4x5x1⅜ plain sections, split $5.00 per crate
400 5¼x6¼x1⅞ sections, 2 side, all for $3.50 for lot

SHIPPING CASES

5 crates of 50 single tier shipping cases for 24 4¼x2 sections ..... $25 per crate
4 crates of 25 safety cases for 24 4¼x1½ sections ..... $12.25 per crate
10 crates of 25 shipping cases, safety, for 24 4¼x1⅞ sections ..... $11.75 per crate
1 crate of 10 2-tier cases for 24 4¼x1½ sections ..... $5.30 per crate
4 crates of 25 cases for 12 4x5x1¾ sections $7.00 per crate
2 crates of 10 cases for 12 4¼x1½ sections $3.00 per crate

EXTRACTORS, HONEY AND WAX

3 No. 10 extractors, never used, fine condition ..... $30.00 each
1 No. 15 extractor, never used, fine condition $32.00
1 Emerson 4-frame reversible, fine condition $60.00

HONEY PACKAGES AND SIGNS

60 cases of 2 60-lb. cans, new cans, used cases, $1.15 per case
15 cases 24 6-oz. glasses ..... 75c per case
3 cases 24 12-oz. jars ..... $1.25 per case
1 honey sign, 25x25 in., slight bend $2.00

Send us your order by return mail.
DADANT & SONS,
Hamilton, Illinois.

FOR SALE

ATWATER HONEY—Supply your customers.

FOR SALE — Apiary; orchard and poultry range, established 32 years ago; home trade for honey, with 75 colonies of bees, fixtures and cellar for 200 colonies; 7-room house, close to the factory district. Write for particulars.
C. F. Lang, La Crosse, Wis.

FOR SALE—Three-banded Italian queens, $1 each.
Alabama Bee Co.,
Rt. 1, Fort Deposit, Ala.

FOR SALE—Good 8-room dwelling, 2½ acres land, all kinds fruits, about 40 colonies bees; 1 mile of town. Price $4,500. Also bargains in 160 acres A-1 land under irrigation; good bee range unoccupied. Special payment plan.
S. J. Harris, Olathe, Colo.

FOR SALE—500 colonies bees and all needed equipment and supplies for good business; ten outyards; fine locations; alfalfa, sweet clover.
C. E. Dibble, Payette, Idaho.

FOR SALE—About 300 hives of Italian bees in 8 and 10-frame hives together with full equipment, all located 6 miles south of Nampa, Idaho, in good district. No disease.
Elton S. Stinson,
New Brunswick, N. J., care Woodlawn.

FOR SALE—Good second-hand 60-lb cans, two cans to a case, boxed, at 60c per case f. o. b. Cincinnati. Terms cash.
C. H. W. Weber & Co., 2163 Central Ave,
Cincinnati, Ohio.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

WANTED

ATWATER HONEY—Supply your customers.

BEES WANTED—One hundred nuclei or packages; no middle man.
C. E. Baines, 136 Lappin Ave., Toronto, Can.

HONEY WANTED—Comb or extracted Spanish needle, basswood or white clover. Send sample and state price, delivered. Will trade Hershiser wax press for honey.
H. M. Showers, Mystic, Iowa.

WANTED—High grade extracted honey; must be clean and good cans and cases. Quote price.
Merton Church, Highland Park, Ill.

WANTED—Comb and extracted honey. State lowest price delivered to Marshfield, and send sample of extracted honey.
The Henseler Apiaries, Marshfield, Wis.

WANTED—Clover honey for bottling purposes; must be finest quality honey, very light in color and not mixed with basswood. Write, stating what you have and lowest price.
Longfellow Bros., Hallowell, Maine.

WANTED—Comb honey. Description and price first letter; also extracted honey; bees.
Frank Coyle, Penfield, Ill.

WANTED—Our own fall crop having been a partial failure, we could use limited quantities of heartsease and Spanish needle honey. Send sample when offering and give price you expect and how put up in first letter.
Dadant & Sons, Hamilton, Illinois.

WANTED—Honey, section, bulk comb and extracted.
W. A. Hunter, Terre Haute, Ind.

WE BUY honey and beeswax. Give us your best price, delivered in New York. On comb honey, state quantity, quality, size and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples.
Charles Israel Bros. Co.,
486-490 Canal St., New York City.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.
A. I. Root Co., Council Bluffs, Iowa.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—We have many calls from educators for copies to complete their files of the older Bee Journals. If you have complete volumes or miscellaneous numbers of any Bee Journals previous to 1900, write us, giving a list, and we will be glad to quote a price. Old bee books, now out of print, are also desirable. We act as a clearing house for this kind of materials.
American Bee Journal, Hamilton, Ill.

MISCELLANEOUS

ATWATER HONEY—Supply your customers.

GRANULATED HONEY SLIPS—60,000 sold this summer. They save talk and trouble. The public is learning. They say: "All Pure Honey will Granulate. * * *" and so on. They say just enough. One thousand for $1.50; less number 23 cents the 100. Postage and insurance paid.
Dr. Bonney, Buck Grove, Iowa.

A BEEKEEPER, Christian home, wishes to correspond with middle-aged country Protestant, kind Christian woman.
5G, American Bee Journal.

LEAGUE EMBLEMS—We still have a number of U. S. Beekeepers' emblems, buttons or pins, bronze or gold. Send 50 cents and get one
American Bee Journal, Hamilton, Ill.

SITUATIONS

ATWATER HONEY—Supply your customers.

WANTED—Position—Young man, 20, wants position with commercial beekeeper for season of 1922; 3 years' experience in beekeeping on small scale. References furnished.
Jos. C. Allen, Alpine, Ala.

Money and Satisfaction for You

Save one profit by buying direct from factory. Standard, Jumbo and Modified Dadant Hives in stock.

Write for catalog

Wanted to buy Comb and Extracted Honey

Address

A. E. Burdick, Sunnyside, Wash.

Southern Headquarters

Package Bees. Reliable Queens.

Three-Banded Italian Only

We solicit your orders for 1922 shipping. We have the stock, equipment and experience necessary to give you prompt, satisfactory service. We have more than 1,000 big, healthy, hustling colonies of pure Italian bees to draw from. Write for our illustrated price list.

W. D. ACHORD, Fitzpatrick, Ala.

NUCLEI OUR SPECIALTY—PACKAGE BEES

THREE BANDED ITALIAN QUEENS

Our BEES and our EXPERIENCE will give you prompt and satisfactory service.

One 2-frame nuclei, no queen, $4; 25 or more, $3.75; 50 or more $3.50; 100 or more, $3.25.

One 3-frame nuclei, no queen, $6; 25 or more, $5.25; 50 or more $5; 100 or more, $4.75.

Queens: One untested, $1.50; 6, $8; 12, $15; 50, $60; 100, $100.
Tested queens, $2.50 each.

Package bees, same prices as nuclei. Write for early order discounts from above prices and our guarantee on shipments. We will surprise you.

COTTON BELT APIARIES, Roxton, Texas

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction top pails. Prices on application.

Early order cash discount on sections, hives, supers, frames, comb foundation and other goods.

Buy now and get supplies ready for 1922. Make out your list and send for our prices.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

IT'S HERE! **WE HAVE IT!**

QUALITY BEE SUPPLIES

POLISHED SHIPPING CASES

One-piece covers and bottoms, glass and paper included, selling at cost prices, as follows:

24-lb., for 1⅞ sections, ---------- $30 per 100
12-lb., for 1⅞ sections ---------- $17 per 100

Write for illustrated catalog on our bee supplies.
We are always ready to serve you.

CHAS. MONDENG
146 Newton Ave. N. and 159 Cedar Lake Rd. Minneapolis, Minn.

BEE SUPPLIES

We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very A-best supplies that money can buy. Only the choicest material suitable for bee hives is used. Our workmanship is the very best.
Get our prices and save money.

Eggers Bee Supply Mfg. Co.
Incorporated
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Pay your debts by growing Hubam while the seed is scarce. Contract for your seed now. Every beekeeper should grow Hubam. The best paying crop today on the farm.

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EVERY STEP IN BEEKEEPING

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A brand-new book based on the most up-to-date scientific information and thorough practical experience that tells **how to keep bees for profit.**

A book of directions, every step made clear, so that the beginner may start right and go forward without floundering. Delightfully written. Author was formerly State Entomologist of Indiana and has been a successful beekeeper for years.

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Annual White Sweet Clover Seed

(James or Alabama Strain)

Start right. Buy your seed from the home of this New Plant.

This clover was discovered growing in Alabama by our Mr. James, in 1919.

Our crop this year was harvested without rain, and we can furnish a very high grade of seed, absolutely pure, grown by us on cultivated lands.

We are offering a limited supply at $2 per pound, delivered. This will be clean, hulled, scarified seed. Germination test must please you. Write for further information as to how to grow, etc.

F. A. James Clover Seed Co

Newbern, Alabama

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FINEST Michigan Raspberry Basswood and Clover comb and extracted honey.

Crate 8 cases 24 sec. Ex. Fancy	$44.00
Crate 8 cases 24 sec. Fancy comb	40.00
Crate 8 cases 24 sec. A No. 1 co'b	36.00
Crate 12 pails, 5-lb., extracted	10.80
Crate 6 pails, 10-lb., extracted	10.20
Crate 2 cans, 60-lb., extracted	14.40

Send Today for Free Sample

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We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

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A. H. RUSCH & SON CO.

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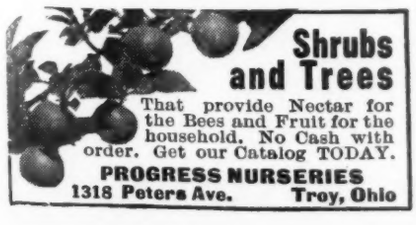

Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES

1318 Peters Ave. Troy, Ohio

1922 PRICES

PACKAGE BEES, with select 3-banded Italian Queens, delivered to your address via parcel post, postage paid by me.

PRICES:

1-pound package with young Italian queen	$4.50
2-pound package with young Italian queen	6.00
3-pound package with young Italian queen	7.50

25 cents per package less for twelve or more packages.

The high quality of my queens, combined with prompt service and reliability, justifies the above prices. Let me book your order now, with 10 per cent cash, balance just before shipping. Will send bees and queens on the day you name. Pure mating of queens, safe arrival, and satisfaction guaranteed.

JASPER KNIGHT, Hayneville, Ala.

THREE-BANDED ITALIANS

BOOKING ORDERS NOW FOR 1922. QUEENS READY APRIL 1.

Will book orders for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada.

Prices for April, May and June:

Untested	$1.25 each; 25 or more, $1.00 each
Select Untested	$1.50 each; 25 or more $1.25 each
Tested	$2.50 each; 24 or more $2.25 each

Select tested $3 each. Circular free.

JOHN G. MILLER, Corpus, Christi, Texas

723 C STREET

ALUMINUM HONEYCOMBS

This modern apiary appliance is being used by beekeepers in many states and countries

Buy these combs from your regular dealer. Any bee supply dealers can furnish them. They are now carried in stock by the following:

IN THE EAST:
G. B. Lewis Company, Albany, N. Y.
Fred W. Muth Co., Cincinnati, Ohio.
G. B. Lewis Co., Lynchburg, Va.

IN THE NORTH:
Dadant & Sons, Hamilton, Ill.
A. G. Woodman Co., Grand Rapids, Mich.
G. B. Lewis Co., Watertown, Wis.
Standard Lumber Co., Winona, Minn.

IN THE WEST:
Chas. H. Lilly's Co., Seattle, Wash and Branches.
Western Honey Producers, Sioux City, Iowa.
Colorado Honey Producers' Association, Denver, Colo.
B. F. Smith, Jr., Fromberg, Mont.
G. B. Lewis, Co., Wichita, Kans.

IN THE SOUTH:
J. J. Wilder, Waycross, Ga.
G. B. Lewis Co., Memphis, Tenn.
Texas Honey Producers' Association, San Antonio, Texas.

LOWER PRICES

For the season of 1922 the prices on Aluminum Honeycombs are greatly reduced.

Modified Dadant or Jumbo frames____60c each
Langstroth or Hoffman frames _____ 50c each
Shallow extracting, any style _____ 45c each

The above prices are f. o. b. factory or dealer's stock. Write to your dealer for quantity discounts on orders of 500 combs or over.

Be sure to buy the combs manufactured in Texas by

THE ALUMINUM HONEYCOMB CO. OF TEXAS
SAN ANTONIO, TEXAS

BEE SUPPLIED NOW

Root Quality, New Prices, Wholesale Discounts

Airco Fdn. 25 to 50 Lb. Lots_____68c
Root 10 fr. Metal Cover, crate of five__$18.00
Std. Hoff- Frs., per hundred_____$ 6.72
Root 10 Fr. Excel. cover crate of five__ 15.00
16 Oz. Jars, 24 to case_____$1.45

Direct or Factory Shipment—Save you Carrying Charges. Prompt Service, Satisfaction Guaranteed

BOX 585 THE SOUTHLAND APIARIES, Hattiesburg, Miss.

NUCLEI FOR SALE—1922 PRICES

Remember that in buying our nuclei you are not only getting two pounds of bees, but three frames of brood, which, when hatched, will double the size of the colony.

Note what these large beekeepers say: "I have no hesitation in recommending you as to your ability to put up bees for shipment, or as to your business integrity. Of the 225 nuclei sent to date, every one came through alive and in fine condition."—R. F. Holtermann, Ontario, Canada.

"Nuclei arrived in fine shape; made 100 lbs. clover honey each. Book me for 100 next spring."—G. F. Saunders, Hornby, ntario, Canada.

H. J. Eisaman, of East Springfield, Pa., states: "While visiting in Mr. R. F. Holtermann's part of the country this fall, I noted the splendid showing your bees had made. Book me for 30 nuclei for May 1."

PRICE LIST OF OUR GOODS

3-frame nuclei Italian bees with Italian queen .....$5.50 each
3-frame nuclei hybrid bees, with guaranteed pure Ital. queen, $5 each
3-frame nuclei black bees, with black queen .....$4.00 each
4-frame nuclei black bees (without queens), fine for building up weak colonies .....$4.00 each
Cypress hives, complete, crate of 5 .....$12.00
Medium brood foundation at 65c per pound.

Terms: One-fourth down to guarantee acceptance. Safe arrival and satisfaction guaranteed. Certificate of inspection will accompany each shipment. Will start shipping April 10, 1922.

A. R. IRISH, Ludowici, Ga.

QUEENS **PACKAGE BEES AND NUCLEI** **QUEENS**

Have a special offer to Beekeepers Associations or groups of Beekeepers that can use a car of bees at a time 800 to 1000 packages. We are prepared to load two cars a week after April 5th, 1922. Free ticket to the party coming down to go back with the car or I can furnish a man. This is the best way, no transferring from one car to another, bees go through in 3 to 4 days.

Also special attention given to small orders.

1922 prices. Booking orders now. Safe arrival guaranteed.

1-lb. package $2.25 each, 25 or more $2.15 each. 2-lb. package $3.75 each, 25 or more $3.60 each.
3-lb. package $5.25 each, 25 or more $5.00 each. 2-comb nuclei $3.75 each, 3-comb nuclei $5.25 each.

Add price of queen wanted.

1 untested queen $1.50 each, 25 or more $1.30 each 1 tested $2.25 each, 25 or more $2.00 each.
1 select, untested $1.70 each, 25 or more $1.50 each. 1 select tested, $2.65 each, 25 or more $2.25 each.

One-fifth down with order, balance just before shipping, or 4 per cent discount for full remittance for December, 3 per cent for January orders.

E. B. Ault, Prop. NEUCES COUNTY APIARIES, Calallen, Tex.

Write for our red catalog with reduced price sheet

Reductions are from 10% to 35% off our spring and summer prices

Let us make your beeswax into foundation **now,** so you will have it ready early in the spring

We also render wax from old combs and slum gum

SEND US A LIST OF YOUR REQUIREMENTS IN BEE SUPPLIES

We sell the best possible goods at the lowest possible prices

W. T. FALCONER MFG. COMPANY, Falconer, (NEAR JAMESTOWN) N. Y., U. S. A.

"Where the BEST Beehives come from"

BARNES' FOOTPOWER MACHINERY

Read what J. E. Parent, of Chariton, N. Y says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."

W. F. & JOHN BARNES
995 Ruby St., ROCKFORD, ILLINOIS

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QUEENS **BEES BY THE POUND FOR 1922** **QUEENS**

You who have tried our bees and queens know their good qualities. Those who have not tested them we suggest their giving us a trial order. Our thousands of satisfied customers testify to their superior traits. We are now booking orders for 1922 delivery, 10 per cent cash with order. No disease, safe arrival and satisfaction guaranteed.

PACKAGES BY EXPRESS

1-lb. packages, with queens, $4.00 each; 12 or more, $3.75 each.
2-lb. packages, with queens, $5.50 each; 12 or more, $5.00 each.
3-lb. packages, with queens $7.25 each; 12 or more, $6.75 each.
By parcel post 10 per cent extra on above.
1½-lb. package, Canadian Special, with queens, by mail, $5.00 each.
Select untested queens, $1.50 each; 12 or more, $1.40 each.
Select tested queens, $3.00 each; 12 or more, $2.75 each.

We do not guarantee safe arrival of bees going to Canada by express. The largest sized packages we can ship by mail to Canada are the 1½-lb. size, as pe above.

M. C. BERRY & CO.
HAYNEVILLE, ALA., U. S. A.

An Acceptable Christmas Gift

OUR BACKDOOR NEIGHBORS
BY FRANK C. PELLETT

A book of stories of common wild creatures which never fails to please the children as well as the grown-ups. These stories are the kind that one loves to read again and again.

Price $1.50 postpaid.

AMERICAN BEE JOURNAL, Hamilton, Ill.

BEEKEEPERS WE MANUFACTURE DOVETAILED HIVES, HOFFMAN FRAMES, SECTIONS AND SHIPPING CASES

Our hives are made of best grade White Pine, cut accurate and smooth to standard measure. Sections are made of Basswood polished on both sides. There are no better made.

We carry a complete line of everything used in the apiary. Our shipping facilities are as good as can be found anywhere. We want your business. We guarantee prompt and satisfactory service. Price list free.

MARSHFIELD MANUFACTURING COMPANY, Marshfield, Wis.

PACKAGE BEES FOR 1922

We Specialize on Three-band Italians Bred for Business.

A 2-pound package of our hustlers with a select untested queen for $5; 25 or more, $4.75 each. Special prices on large lots. One-fifth cash books your order. Order early and make sure of shipping date. We do not accept more orders than we can fill promptly.

CANEY VALLEY APIARIES, Bay City, Texas
J. D. YANCEY, Mgr.

Books on Beekeeping

First Lessons in Beekeeping, by C. P. Dadant. 167 pages, 178 illustrations. Cloth $1.

Dadant System of Beekeeping, by C. P. Dadant. 118 pages, 58 illustrations. Cloth $1.

The Honeybee, by Langstroth and Dadant. 575 pages, 229 illustrations. Cloth $2.50.

Outapiaries, by M. G. Dadant. 125 pages, 50 illustrations. Cloth $1.

1000 Answers to Beekeeping Questions, by C. C. Miller. 276 pages, illustrated. Cloth $1.25.

American Honey Plants, by Frank C. Pellett. 300 large pages, 155 illustrations. Cloth $2.50.

Practical Queen Rearing, by Frank C. Pellett. 105 pages, 40 illustrations. $1.00.

Productive Beekeeping, by Frank C. Pellett. 326 pages, 134 illustrations. Cloth $2.50.

Beginner's Bee Book, by Frank C. Pellett. 179 pages, illustrated. Cloth $1.25.

Beekeeping in the South, by Kennith Hawkins. 120 pages, 58 illustrations. Cloth $1.25.

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HAMILTON, ILL.

PORTER BEE ESCAPE
SAVES HONEY TIME MONEY

For sale by all dealers
If no dealer, write factory
R. & E. C. PORTER, MFRS.
Lewistown, Illinois, U. S. A.
(Please mention Am. Bee Journal when writing)

Crop and Market Report

Compiled by M. G. Dadant

CROP AND MARKET REPORT

Belated reports coming in from beekeepers would indicate that the total honey crop will be considerably in excess of our report for last month. This is mostly due to the favorable weather in the fall months, which resulted in a much better fall crop than was expected. This larger fall crop also came in regions which are not generally to be considered as fall crop regions. Michigan and Wisconsin have had very good fall crops, whereas, the Mississippi and Illinois River bottoms, which generally have an abundant fall flow, fell very much under the average for the past five years, and even below the 1920 crop.

A report just received from the Bureau of Crop Estimates at Washington, gives the per colony average of honey for the United States for 1921 as 44 pounds, compared to 59 pounds in 1920, and a five-year average of 43 pounds. Some of the short crop States are California, with an average of 23 pounds as against 93 pounds in 1920; Nevada, with 25 pounds instead of 83; Arizona, with 42 pounds instead of 92; Wisconsin with 42 pounds instead of 85, and North Carolina with 10 pounds instead of 55.

Those States producing a considerably larger crop than in 1920 are Maine, Georgia, Florida, Ohio, Michigan and Mississippi

A peculiar condition existed in Utah. Castle Valley produced its normal crop of approximately seven cars, while the Uintah Basin, generally a large producer, shipped very little honey.

Latest reports from Texas would indicate that the final 1921 crop for the whole State will be slightly in excess of 1920. Earlier reports of a short crop for California are verified.

THE HONEY MARKET

Very probably the excessive demand during October for carload lots of honey has not held up proportionately during November, though still much in excess of the demand for the same time last year. There is still a very active demand, however, for good grades of white honey. The consumer is buying. Low sugar prices, while interfering with sales of amber honey, seem to have had no effect on the white honey trade. In fact, all reports, from wholesalers, retailers and beekeepers alike, would indicate that the consuming public seem to have been brought to a realization of the value and desirability of white honey as a good product. Whereas, the cheaper syrups are a drug on the market, honey is moving well.

This applies, naturally, to those markets which demand the white honey. In the markets where amber honey is sold, the competition of the cheaper imported amber honeys and of sugar is still being felt, though indications are for a gradual improvement.

Many reports from beekeepers, both large and small, are to the effect that the demand is excellent; that they will be unable to supply their regular demand from their own stocks, but will have to buy elsewhere or let the customers go.

This is the opportunity to keep up the supply, encourage the demand and clean up the supplies of honey in good shape for the 1922 season. Many have argued, formerly, that in the honey business it was not over supply, nor lack of demand, but lack of proper distribution, and we are inclined to agree. All too true it is, that every demand should be supplied, either by the handling of outside honey by the beekeeper, or referring such an unfilled demand to parties who can take care of it.

HONEY PRICES

There has not been much change in the retail prices of honey, and what there has been has been upwards. Most of the now small class who do not know market prices have disposed of their crop at unreasonably low prices, and the tendency is towards a stabilization. The jobbing market for amber honey has not seen much change, but white honey has slightly stiffened, though white sweet clover extracted is still offered at about 8½ cents to 9 cents f. o. b. shipping point, which would make a minimum New York price of around 9½ cents for white.

The Southeast, which has complained all along of the slowness of the market and the great damage done native honey by the imported product, is in a little better shape, and the demand is becoming some better.

All in all, we would imagine that the honey situation is far from hopeless and that the large demand and large shipments should, before spring, lead to a favorable condition in the honey supply and honey price.

Let us hope, however, that such favorable signs as there may be will not tend to make for a slackening effort in selling, or tend to boost prices on the part of the handler beyond what is reasonable and just.

RETAIL PRICES

The above prices refer to car lots. Freights, commissions, packing and handling bring the price up to double these figures before the honey reaches the consumer. In most localities white honey is retailing at from 20 to 30 cents per pound in 5 and 10-pound pails. In glass further costs are added. The beekeeper who retails his own crop should not overlook the fact that the packing and selling of his product is a different proposition from producing, and should profit by the selling as well as the production of his crop.

SUPERIOR FOUNDATION

While the hum of the bees grows fainter, the hum of our machinery grows stronger, preparing for another enormous spring demand for Superior Weed Process Foundation

When buying secure the best

Manufactured by SUPERIOR HONEY CO., Ogden, Utah

If you want the cheapest, buy the best. I am offering to the trade of 1922 Nuclei, Nuclei and more Nuclei

Let me prove to you that one of my 3-frame nuclei is worth more to you than a 2 or 3 pound package; besides, they cost you less.

1st. One of my 3-frame nuclei is equal to a swarm of bees, as you get young bees and brood in all stages, and the queen laying enroute.

2nd. There is no trouble about transferring them, and the bees are fresh and not worn out from fretting as they are in pound packages.

3rd. The purchaser has an absolute guarantee that they will arrive in good condition.

4th. The three combs, if empty, are worth more than the difference in the price of freight. Last season I shipped over eighteen hundred nuclei, with a loss of only two. Can the pound package shipper give such a record?

Read what one of my customers says: St. Thomas, Virgin Islands, U. S. A., June 21, 1921. Mr. A. B. Marchant, Jesup, Ga. Dear Sir: "The four three-frame nuclei arrived today in perfect order, only stores were gone, and they could not have lasted a day longer, as they were on the road 28 days." Sincerely yours, Axel Holst. The above settles the question as to safe arrival.

Now a few words about my frames and combs. My frames are genuine Hoffman wired, with shoulders cut at each end of the end bars, which makes them fit square and even.

My combs are drawn from full sheets of the famous Dadant foundation. There is none so good.

My shipping facilities are the best, having twenty or more express trains every twenty-four hours. Some of them going to New York and other points without a change.

Prices of my 3-frame nuclei, with a select untested queen, $5.50 each. Ten per cent cash with order to show good faith, balance any time before shipping.

Should a customer become dissatisfied and we cannot adjust the matter, then send your claim to the A. B. J. and I will abide by whatever they do.

My bees are all bright 3-banded Italians. A great many breeders call them goldens.

To those that have weak colonies and wish to build them up, I can furnish nuclei without queens from fifteen to twenty days earlier, price, $5 each.

I can also furnish full colonies in 8 and 10-frame hives; prices quoted on application. Shipping season depends on the weather, usually begins April 15th.

I can load a car in 48 hours, as I have over 1,000 colonies to draw from.

My Guarantee: Safe arrival in U. S. and Canada, free from disease, pure stock of Italians, quick and prompt service, and a satisfied customer.

THE NUCLEI MAN. **Reference: THE BRUNSWICK BANK & TRUST CO., Jesup, Ga.**

A. B. MARCHANT, Jesup, Georgia

PATTERSON & WINTERS

QUEENS

Early Order Discounts for 1922 on Queens and Package Bees

Orders received during November, 1921--10% Orders received during January, 1922-- 6%
Orders received during December, 1921-- 8% Orders received during February, 1922-- 4%
Orders received during March, 1922----- 2%

One fourth cash with order, balance before shipment.

QUEENS

1 untested Queen $1.25, 25 or more ---------- $1.00
1 tested Queen $2.50, 25 or more ---------- 2.25
1 select tested Queen, $3.00, 25 or more ---------- 2.50

NUCLEI

Two-comb regular Nuclei ---------- $3.60 Twenty-five or more ---------- 3.45

PACKAGES

One 2-lb. package, $3.60; 25 or more ---$3.45 One 3-lb. package, $5.00, 25 or more --- 4.75
Add price of queens wanted when ordering above packages.

PATTERSON & WINTERS, Jourdanton, Tex.

References: Adams Nat. Bank, Devine, Texas; Atascosa State Bank, Jourdanton, Tex.

HONEY

WANTED

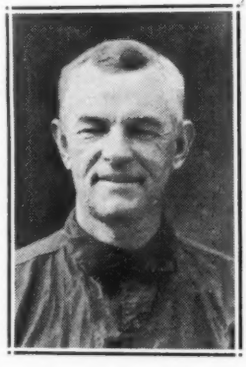
HONEY

We are in the market for both comb and extracted. Send sample of extracted, state how put up with lowest price delivered Cincinnati. Comb honey, state grade and how packed with lowest price delivered Cincinnati. We are always in the market for white honey if price is right.

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

I HAVE SHAVED

my prices on queens for the season of 1922 to conform to the general reduction in prices of other commodities, but the high quality will be maintained; in fact, I make it a rule to produce better queens every year. My experience has shown me that the stronger the colony that builds the cells, the larger, better and more uniform will be the queens thus reared. While it is more expensive to produce queens in this manner, for many colonies are weakened in order to supply brood for the cell builders, yet it pays us, as it creates a steady demand for our queens at prices that are fair to all concerned. But it pays the purchaser still more, for he gets splendid queens that give large returns in honey.



The season just closed was very satisfactory in that we were able to fill most orders at the time promised, but still we had some more orders than we were able to fill. We are increasing our nuclei and will make an earnest effort to give prompt service the coming year, but I solicit the co-operation of our customers in this matter, and in order to facilitate prompt shipment, we request that you anticipate your needs as far in advance as possible and place your order early. No cash is required in booking an order, but money may be sent any time before date of shipment. However, as some will find it convenient to send cash with order, we will allow a **discount of 6 per cent on all cash orders received in December.** A card will bring our catalog.

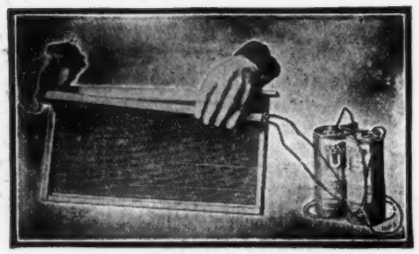
1922 Prices.—Before August 1.		After August 1.	
1 to 4, inclusive	$2.50 each	1 to 4, inclusive	$2.00 each
5 to 9, inclusive	2.45 each	5 to 9, inclusive	1.95 each
10 or more	2.40 each	10 or more	1.90 each
		Breeding queens	10.00 each

JAY SMITH, ROUTE 3 Vincennes, Indiana

ITALIAN BEES AND QUEENS

Let us quote you on the bees and queens you will need in 1922. We can save you money and will guarantee the goods and service. Tell us how many you need, we will quote you special prices.

THE STOVER APIARIES, MAYHEW, MISSISSIPPI



ELECTRIC IMBEDDER

Price without Batteries,$1.50
Not Postpaid.

Actually cements wires in the foundation. Will work with dry cells or with city current in connection with transformer. Best device of its kind on the market.

For sale by all supply dealers.

Dadant & Sons, Manufacturers HAMILTON, ILL.

We are the HUB for HUBAM

Guaranteed, certified, Annual Sweet Clover. All new crop, grown on our own farms and all from the first 50 seeds from that original plant at Ames.
We are shipping to all parts of the world now. HUBAM is being planted somewhere every day for bee pasture, hay, pasture, or for green manure to plow in.

The seed is hulled and scarified, with a purity of 99.8 per cent, and grows 97 per cent. Price now is $2 per pound.
Our seed is pure. You buy from an old, established firm with a reputation to maintain when you buy from

THE HENRY FIELD SEED CO.
SHENANDOAH, IOWA

1922

Place your order now for 1922 delivery of

FOREHAND'S THREE-BANDS
The Thrifty Kind

They are surpassed by none, but superior to many.

Package Bees. Three-band Queens

Write for prices now.

W. J. FOREHAND & SONS
Fort Deposit, Ala.

5 REASONS WHY—

YOU WILL WANT TO SEND US THE COUPON AT ONCE

Money Saved is Money Made

THE A. I. ROOT CO. OF IOWA,
Council Bluffs, Ia.

Gentlemen: Kindly name your fall prices of the following:

1. Eight-frame hives, metal covers, complete, sets 5 KD.
2. Eight-frame bodies, with frames, complete, sets 5 KD.
3. Shipping cases, lots of.....
4. Cans. jars, pails and second-hand 5-gallon cans.
5. Honey tanks.

Name .....

Address .....

City .....

State .....

THE A. I. ROOT CO. OF IOWA

COUNCIL BLUFFS, IOWA

TIME TO STUDY WOODS

For the Bee Man This is the Period "Between Hay and Grass"

While waiting for the honey-season to begin, suppose you investigate the relative values of different commercial woods. Few business undertakings call for more exacting care on the part of the buyer than getting the best lumber for the bee-man's use. In many respects bee-hive construction is like Greenhouse construction—both are most trying on the material used.

Cypress is the only wood that "stands up" in Greenhouse work. It resists the rot influences that infest the Greenhouse. No other wood is so thoroughly certified for this use as is Cypress.

If Cypress will "stand the racket" in Greenhouse construction it certainly will do the right thing by you in beekeeping.

READ CYPRESS BOOKS

Those who would get accurate information regarding Cypress wood and its extraordinary power to resist rot influences should provide themselves with copies of the Cypress Pocket Library. There are 43 volumes, each authentic and authoritative. **Write us** and tell us what subject you are interested in and will send you the appropriate booklet. We especially suggest you **write for Vol. 1,** with the unabridged U. S. Govt. Rept. on Cypress, "The Wood Eternal," that is a **buy** because it lasts so like—well, it lasts and lasts and lasts and lasts and lasts.

SOUTHERN CYPRESS MANUFACTURER'S ASSOCIATION

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FOR QUICK SERVICE ADDRESS NEAREST OFFICE

DO YOU USE ALUMINUM HONEYCOMBS?

IF NOT, WHY NOT?

Each comb is in itself a valuable asset to any apiary. It is the only comb which enables BEEKEEPERS TO OBTAIN ALL THE HONEY without waiting for the bees to draw out foundation. THEREBY SAVING TIME AND MONEY.

We can prove that no practical BEEKEEPER can afford to be without the ALUMINUM HONEYCOMB

In a recent issue of a National Bee Publication the following question and its answer appeared:

Q. What is the total cost of a fully drawn out wax comb?
A. The mininum cost of drawing out a wax comb is 50 cents.

PRACTICAL BEEKEEPERS are buying ALUMINUM HONEYCOMBS because they

Cannot be destroyed by moths or rodents
Make extracting of honey easy
Control production of drones
Can be sterilized
Prevent loss by melting
Increase production
Last forever with reasonable care
Cost no more than wax combs

THE DIAMOND MATCH CO., Apiary Dept., CHICO, CAL.

Sole distributors for DUFFY-DIEHL, Inc., Pasadena, Cal

This is the First of a series of advertisements which will appear from month to month featuring "Root Quality" products which are the results of revolutionary developments in manufacturing supplies and equipment for beekeepers and honey producers.

AIRCO

On this page next month will be given a brief sketch of development of the honey extractor from the first crude machine down to the latest modern product of engineering skill and mechanical design.

The Comb Foundation with a Perfect Cell Base

After years of experimenting and at an expense of thousands of dollars, the new Airco process of manufacturing comb foundation was perfected. That this time and expense was justified is amply demonstrated by the numberless testimonials received from all parts of the world. Airco foundation has marked a new era in beekeeping.

The superiorities of Airco over the old-style foundation made upon cut mills are two-fold:

1. The new milling process makes possible a base with a natural comb angle; a base with no distortion; a foundation with no imperfect cells; and a foundation with reinforced and braced cell walls.

2. The new refining process insures denser and tougher wax, cleaner wax, more ductile wax, and wax that stays fresh much longer.

ASK THE BEES—They know what they want and why they want it.

Send for our free booklet, "Why Bees Prefer Airco Comb Foundation."

Order early and save delay. 4 per cent early-order cash discount for December.

"There is a Root Dealer near you"

THE A. I. ROOT COMPANY, Medina, O.

Fifty-two Years in the Bee Supply Industry

New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Chicago, 224 W. Huron St.
Indianapolis, 873 Mass. Ave.
St. Paul, Minn., 290 E. 6th St.
Norfolk, Va., 10 Commerce St.
New Orleans, La., 224 Poydras St.
Syracuse, N. Y., 1631 W. Genesee St.
Savannah, Ga , 126 W. Bay St.

(Watch this page in the January issue for the next installment)